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ABSTRACT

Often a community's largest single investment is in its physical plants, including public school buildings and grounds. An essential factor in efficient school district operation is a well-organized, responsive plant operations and maintenance division. Maintenance has generally been defined as those services, activities, and procedures concerned with preserving, protecting, and keeping the buildings, grounds, and equipment in a satisfactory state of repair. By maintaining school plants at optimal efficiency levels, operational costs are kept low. Maintenance staffs differ from district to district, depending on the scope of operations, and may include painting, masonry, carpentry and cabinet-making, electrical services, refrigeration, office machines repair, television and electronic equipment repair, pipefitting and plumbing, plastering, heating and ventilating, sheet metal, furniture repair, landscaping and grounds maintenance, glazing, and various types of shop and machine work. The first chapter discusses facilities maintenance and operations organization. Succeeding chapters focus on job descriptions, preventive maintenance, energy conservation, snow removal and sanding, grass cutting and field maintenance, community use of facilities, and bid specifications. Appendices contain sample forms for employee performance ratings, work requests, pesticide procedures, school facility use policies, inspection logs, and specifications. (MLH)

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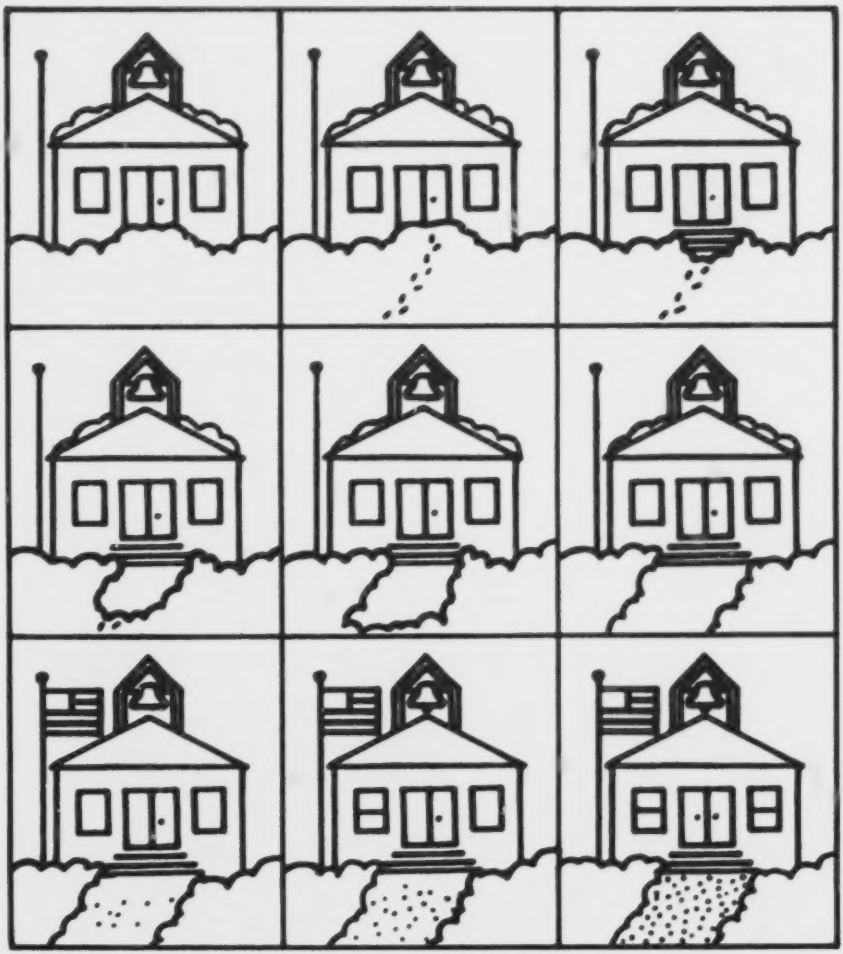
School Facilities Maintenance And Operations Manual



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INTRODUCTION

Often a community's largest single investment is in the physical plants that it owns. Generally, the largest share of the publicly owned buildings is the public school buildings and grounds. These buildings are often used from early in the morning until late in the evening—used by the students who attend the school during the day and by community groups who use the school buildings after school hours for a variety of reasons. School buildings are no longer the "sleeping giants" they were in years gone by. It is widely recognized that the community owns the buildings and as a consequence should be able to use them.

All too many times, however, despite the initial investment in buildings and grounds, when the crunch comes and dollars are in short supply, the first area to be cut is the maintenance and upkeep of the buildings and grounds. Left to go unattended relative to necessary preventive maintenance procedures, the buildings deteriorate to the point where it becomes obvious to the most casual observer that the buildings are "old" and need major renovations, need large infusions of money to remedy years of relative neglect.

It has been widely accepted that as a school district goes, so goes the city. In those instances where the city cares, the buildings are shining examples of the commitment to the upkeep of that major investment. Many schools have grounds that are in excess of 20 acres, good-sized pieces of real estate. Many buildings have updated, state-of-the-art equipment that needs to be cared for.

The dedication of the individuals working in the plant maintenance and operations divisions of school districts have kept the buildings in as fine a state of repair as possible, recognizing the available dollars, so that the children and community can reap the benefits of their investment and continued support.

An essential factor in the efficient operation of a school district is a well-organized, responsive plant operations and maintenance division. The operation generally includes the day-to-day services necessary to maintain the physical plants and grounds in a usable condition for the purposes for which they were intended. Maintenance has been defined as those services, activities and procedures which are concerned with preserving, protecting and keeping the buildings, grounds and equipment in a satisfactory state of repair. Its activities include repairs, replacements when necessary, renovations and adjustments.

To delay proper maintenance is to add to the cost of maintaining the building and hastens the need for renovation/replacement of the components thereof. An efficient school plant maintenance service is vitally important to the students, the staff, the educational program being delivered and the community it serves. By maintaining school plants at optimum levels of efficiency, operational costs are kept low.

Good school plant maintenance doesn't "just happen." It must be well-planned, staffed by competent personnel and given a fair share of the school district revenue in order to operate to serve the best interests of the students. It must be managed efficiently. It is generally believed that not less than five percent of the district's operating budget is required to support an adequate maintenance program.

The maintenance staffs differ on a district-by-district basis, depending on the scope of operations and may include: painting, masonry, carpentry and cabinet-making, electrical, refrigeration, office machines repair, television and electronic

equipment repair, pipefitting and plumbing, plastering, heating and ventilating, sheet metal, furniture repair, landscaping and grounds maintenance, glazing and various types of shop and machine work.

In order to develop a well-planned, efficient, low-cost maintenance program it is necessary to know the specific needs of each district facility. These needs are identified through long-range planning, routine inspections and periodic checks, community suggestions and emergency requests. The needs are then categorized into five needs as to type: recurring, periodic, replacement, emergency and improvement.

Recurring maintenance refers to school maintenance tasks and jobs which are generally performed one or more times a year. Examples are roof and furnace maintenance.

Periodic maintenance is needed for those items that recur, but on a cyclical basis, such as the painting cycle and the cleaning of septic tanks.

Replacement maintenance occurs when it becomes too costly to continue to repair, or the repair is no longer possible. Examples include audio-visual equipment and classroom furniture.

Emergency maintenance is done when and as needed to relieve an emergency condition.

Improvement maintenance is done to improve the functioning of the plant or to accommodate a new program.

FACILITIES MAINTENANCE AND OPERATIONS ORGANIZATION

The manner in which facilities maintenance and operations departments are organized is largely dependent upon the size of the district, the condition of the buildings, the relationship of the district and the city/town of which it is a part, and the extent to which the district decides to contract for services in this area.

The individual heading the facilities maintenance and operations department may be titled in any number of ways: Director of Plant Operations and Maintenance, Director of Operations and Maintenance, Director of Physical Plant, Maintenance Supervisor, Maintenance Superintendent, Director of Operations, etc. That individual traditionally reports to the Assistant Superintendent for Support Services, the School Business Manager, the Superintendent of Schools, etc. Again, the size and scope of the operation determines the number of individuals employed, their job titles, and job responsibilities, including to whom they report.

On the charts which follow you will find an organization chart for a small district with a small department; a small district's system-wide organizational structure with the maintenance operations shown in relationship to the other components of the district; the organization chart of a department in a moderate-sized school district; and the facilities management department's organization chart for a large school district.

Adaptations need to be made to accommodate the manner in which a school district wishes to accomplish the needed operations.

Staffing

The number of staff members in the department and the skills needed by the staff are a direct reflection of the scope of operations to be carried out by the maintenance department.

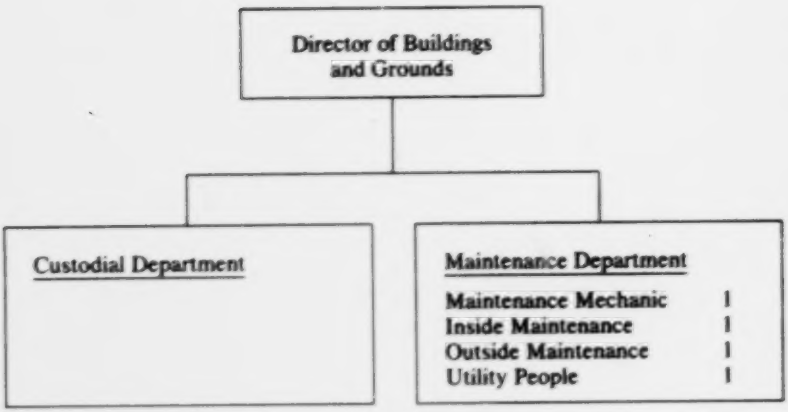
Centralized Staffing—Where feasible, districts centralize the maintenance staff in one location from which they are given their work assignments each day. They are able to pick up the materials needed to complete the job and proceed to the location.

Decentralized Staffing--Where the district is very large, and travel is a concern both as to time and distance, certain staff members are decentralized and housed in various parts of the district. Their access to the job sites is much closer; their response time is much faster. The workers are able to get to know the buildings and personnel in them and thereby be more responsive to the needs of the building.

Mobile Crew—Many districts put together a mobile crew that goes from building to building on a rotating basis and takes care of all the minor maintenance that the staff custodians have not been able to take care of. The crew's stay in a building depends on the amount of work that needs to be done. It has been found to be

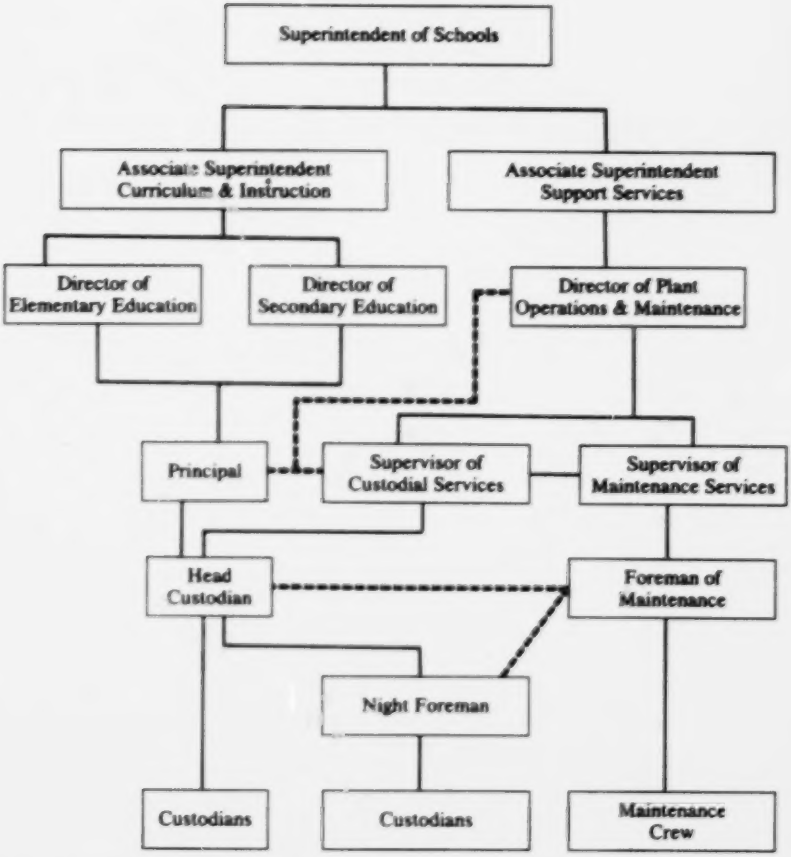
ORGANIZATION CHART

SMALL DEPARTMENT



ORGANIZATION CHART

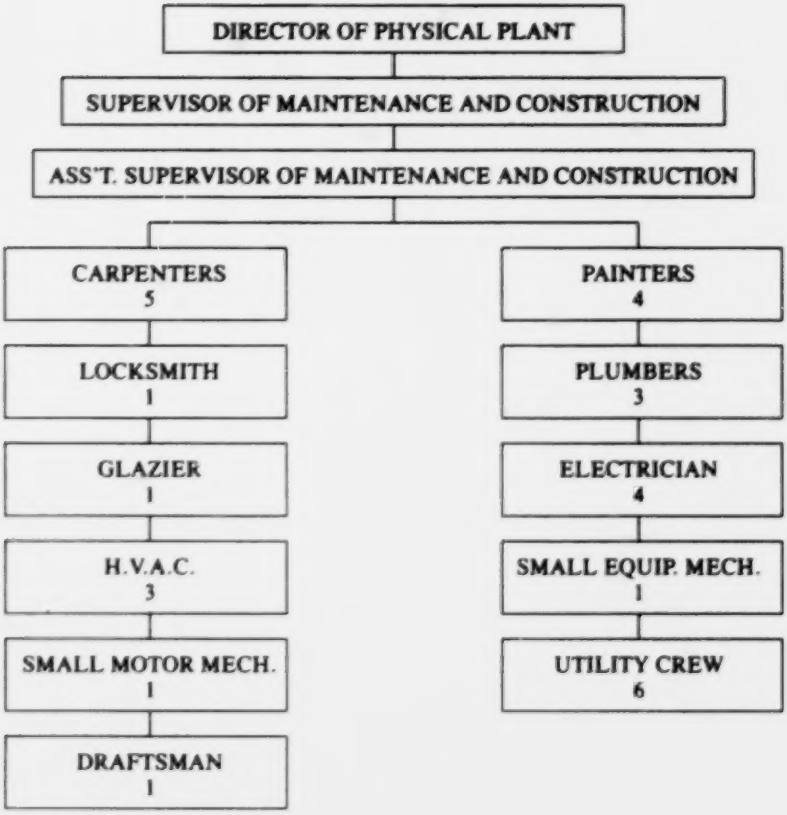
SYSTEM-WIDE STRUCTURE
SMALL SCHOOL DISTRICT



Note: Delineates custodial services from plant maintenance operations which includes construction and alterations to buildings, emergency repairs, normal repairs and scheduling of preventive maintenance beyond capabilities of custodian, such as painting.

ORGANIZATION CHART

MODERATE SIZE SCHOOL DISTRICT



Courtesy: ISD #709, Duluth, MN

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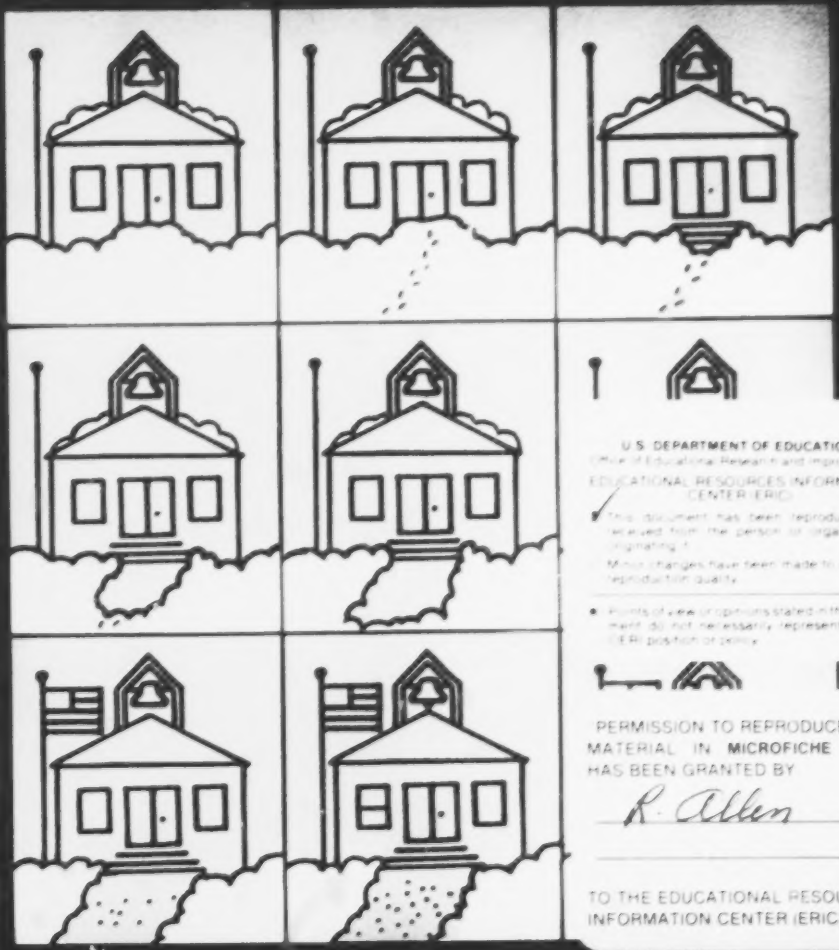

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cost-effective to have this done because it eliminates travel time for each little item.

Building-Based Maintenance—Many large high school plants have a maintenance person assigned to it to take care of items that need doing on a regular basis. Because of the frequency of items, and the number, it has been found to be cost-effective to staff this way. Central staff respond when the building-based person cannot perform the task that is needed. This building-based person would have a general working knowledge of carpentry, plumbing, painting, heating and air conditioning, mechanics, electricity. This person would be able to perform those jobs within his or her range of expertise. The bulk of the jobs done would be in the area of repair work.

Operating Engineers and Firemen

Many states require the presence of a licensed operating engineer or fireman depending on the equipment to be run "in the interest of safety and efficiency in the construction, operation, use and inspection of such steam and power generators, heating plants, hoisting machines, refrigeration equipment, pressure vessels . . . . " (New Jersey Administrative Code, 12:90-1.1)

New York State's Amendment of Industrial Code Rule 14 relating to Construction, Installation, Inspection and Maintenance of Steam Boilers, Subpart 14–16, Boiler Operating Engineer, Section 14–16.1 states, "The commissioner finds that the operation and maintenance of a high pressure boiler involves such elements of danger to the lives, health and safety of persons employed in such operation and maintenance and of persons lawfully frequenting the area of premises where such boilers are located as to require special regulations for their protection. Such boilers may become hazardous and dangerous unless operated and maintained in the responsible charge of persons of proper ability, judgment and diligence. Further, such boilers may become wasteful of energy resources and harmful to the environment through pollution of the atmosphere unless operated and maintained in the responsible charge of said persons of proper ability, judgment and diligence." Section 14–16.3 defines a Boiler Operating Engineer as "a person who is responsible for the operation and maintenance of a high pressure boiler and who is the holder of a valid certificate of competence issued by the commissioner."

State requirements must be met for the licensing of these individuals where required by code.

Employee Handbook & Orientation

Orientation to the district is important. An employee needs to know what is expected and what to expect from the district. By preparing an employee handbook and going over it with the employee during the orientation session(s), you give the employee the feeling that the district cares and the employee knows what to do should a concern come up. See a typical Table of Contents of an employee handbook in this section.

Staff Development/Training

A program of staff development/training needs to be developed in order to continue to upgrade the staffs' skills and to apprise them of new products and procedures. Scheduling this training on "company" time is essential to maintain high staff morale.

EMPLOYEE HANDBOOK

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Courtesy: Perkiomen Valley School District, Schwenksville, PA

JOB DESCRIPTIONS

It is recognized that the scope of responsibilities of the Maintenance Department determines the various categories of employees retained by the district. The following pages present job descriptions for positions that often fall within the scope of the Maintenance Department. Each job description lists the function of the position and provides information on characteristic duties and responsibilities. The job descriptions as identified herein are adaptations of those submitted by school districts.

—General Mechanic
—Maintenance Mechanic
—Inside Maintenance
—Outside Maintenance
—Carpenter Supervisor
—Carpenter Tradesworker
—Handyworker
—Foreman Electrician Tradesworker
—Electrical Tradesworker
—Plumbing Tradesworker
—Heating and Air Conditioning Serviceman
—Heating and Gasfitter Tradesworker
—Grounds Supervisor
—Grounds Lead Hand
—Grounds Utility Worker
—Gardener—Tradesworker
—Casual and Regular Staff Grounds Laborers
—Summer Laborers (Students)
—Machine Operators I and II
—Paint Supervisor
—Lead Hand Paint Tradesworker
—Painter Tradesworker
—Lead Hand Audio Visual Technician
—Audio Visual Technician
—Maintenance Utility Worker
—Mail, Pickup/Delivery Worker
—Maintenance Superintendent
—Assistant Maintenance Superintendent

There is a need to pick and choose or put together job descriptions by selecting responsibilities from the various job descriptions included here.

Job titles need to be adapted to conform with local nomenclature, utilization and custom. For example, lead hand may be called lead man, foreman, over chief, etc.

General Mechanic

Function:

Under the supervision of the Director of Buildings and Grounds performs a variety of minor maintenance and repair work relating to the operation and maintenance of buildings and structures. Performs minor administrative work pertaining to the maintenance management program and is expected to exercise good judgment in completing work assignments.

Characteristic Duties and Responsibilities:

—Performs a wide variety of repair and maintenance tasks assigned which involves work in all trades (carpentry, plumbing, electrical, air conditioning, etc.) at any building or structure.
—Repairs and maintains wood and metal shelvings and railings; repairs damaged sections of wood floors; erects and removes wood, metal, and glass partitions; repairs doors and windows; cuts and installs glass in windows or doors; lays or replaces linoleum and asphalt tile floors; makes minor furniture repairs; installs and repairs window shades and venetian blinds.
—Makes minor plumbing repairs such as clearing stoppages in toilet bowls or urinals; replacing valves and seats on water and air lines; repairing flushometers; installing waste, vent and water lines as directed.
—Installs and repairs drinking fountains, sinks, faucets, toilet bowls, and related fixtures. Cuts, reams, threads and bends pipe and tubing.
—Records and takes inventory of all service call requests and preventive maintenance accomplishments on a day-to-day basis.
—Receives material and inventory and stocks same until required for project.
—Makes minor repairs to put equipment back into operation such as replacing fuses, belts, bare wire, or opening and closing valves and pushing reset buttons.
—Makes minor repairs to a variety of electrical equipment such as light fixtures, switches, small motors, electrical circuits.

Maintenance Mechanic

Function:

Under the supervision of the Director of Buildings and Grounds, maintains the physical school plant in a proper operating condition and maintains the proper degree of safety so the full educational use of the plant is possible at all times.

Characteristic Duties and Responsibilities:

—Repair, replacement, and troubleshooting of all electrical equipment in the district. This includes lighting fixtures, wall switches, fuse and breaker boxes, safety boxes, and associated equipment (electric motors, etc.) up to and including 220 volts.
—Repair, adjust and troubleshoot all heating (boiler) problems.
—Repair, replace, and install new plumbing fixtures, and any and all plumbing fixtures, pipes, steam, and water lines. [The exception is the installation of piping over 1¼". (Use plumbing contractor.)]
—Responsible for all repairs and maintenance to school district transportation fleet and maintenance vehicles.

—Respond to any maintenance problem as deemed necessary by the Director of Buildings and Grounds.
—Assist the Director of Buildings and Grounds in setting up and implementing a districtwide preventive maintenance program.

Inside Maintenance

Function:

Under the supervision of the Director of Buildings and Grounds, maintains the physical school plant in a proper operating condition and maintains the proper degree of safety so the full educational use of the plant is possible at all times.

Characteristic Duties and Responsibilities:

—Carpentry and cabinet making—build bookcases, cabinets, divider walls, etc., as requested. Repair desks, cabinets, and any wooden equipment located in the school district.
—Window glazing—the repair and/or replacement of broken windows up to 4' × 4' size. [Above this size, the reglazing will be done by an outside contractor.]
—Building hardware—i.e. panic bar, window latches, door knobs, door closers. The repair and/or replacement of all building hardware.
—The installation and/or repair of gym equipment, movie screens, playground equipment, etc.
—Any maintenance problem deemed necessary by the Director of Buildings and Grounds.

Outside Maintenance

Function:

Under the supervision of the Director of Buildings and Grounds, maintains the physical school plant in a proper operating condition and maintains the proper degree of safety so the full educational use of the plant is possible at all times.

Characteristic Duties and Responsibilities:

—Lawn and grounds maintenance—mowing of lawns and fields, trimming of bushes and trees, raking leaves, plowing snow, lining all district athletic fields, and planting and fertilizing all grounds as needed.
—Roofing repairs—leaking roofs and the summer roof maintenance program.
—Do preventive maintenance and light repairs on all outside maintenance equipment.
—Do all welding, brazing, and cutting work for maintenance division.
—Substitute district van and school bus driver.
—Any maintenance problem deemed necessary by the Director of Operations and Maintenance.

Carpenter Supervisor

Function:

The Carpenter Supervisor shall be responsible for the carpenter and general maintenance of all district school buildings and equipment. The Carpenter Super-

visor shall work under the supervision of the Director of Buildings and Grounds or in his or her absence, the Asst. Director of Buildings and Grounds.

The Carpenter Supervisor shall insure that all fire, health, safety and building inspection regulations are observed in the repair and maintenance of district buildings.

Characteristic Duties and Responsibilities:

—Assumes primary responsibilities for the safe condition of all buildings, e.g. repairs to doors, windows, cupboards, ceiling tile, floor coverings, toilet stalls, lockers, roofing, hardware, stucco, etc.
—Determines which repairs may be performed by in-house crews and which must be performed by outside contractors and advises the Director of Buildings and Grounds.
—Supervises the general repair work done by district staff.
—Instructs maintenance workers in the proper method of procedures and proper use of tools.
—Recommends supplies and equipment for purchase, and maintains the inventory of district owned tools, equipment and supplies in his department.
—Estimates costs of carpentry repair projects, material and overhead for the annual budget, including labor for capital projects.
—Examines district-owned facilities on a regular basis for purpose of preventive maintenance.
—Recommends the hiring of temporary and regular staff to the Director of Personnel. Determines retention or release of probationary staff in consultation with the Director of Buildings and Grounds.

Carpenter Tradesworker

Function:

Is a journeyman carpenter hired to do repairs and preventive maintenance to school district facilities primarily in the trade for which he or she was hired. Works under the supervision of the Carpenter Supervisor or the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Performs the work required to the highest possible level within allocated funding.
—Keeps the workplace clean and safe.
—Makes suggestions for organizational, project or equipment improvements.
—Sees that projects are carried out to completion and that materials and equipment are promptly and completely removed from the job site.
—Carries out other duties in any trade as may be required.

Handyworker

Function:

To assist Carpenter Tradesworker in all phases of maintenance shop work. Will work under the direction of shop carpenter and shall report to the Carpentry Section Supervisor or any designated Supervisor in his or her absence.

Characteristic Duties and Responsibilities:

—To assist shop carpenter in all types of work done in the maintenance shop.
—Repairs made to furniture, desks, chairs, etc.
—Assembling of cabinets and cupboards required by schools.
—General repairs to other school equipment that cannot be done in the field.
—Using shop power equipment as required to do necessary work.
—Keep shop in a safe and clean condition.
—Help in the loading and unloading of supplies and materials.
—Carry out such work as may be assigned.

Foreman Electrician Tradesworker

Function:

The Foreman Electrician Tradesworker is a journeyman electrician in charge of the electrical crew and the repair and maintenance of all electrical, fire and emergency systems in the school district. The Foreman works under the supervision of the Asst. Director of Buildings and Maintenance or in his or her absence the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—On call for security and electrical problems.
—Supervise directly day-to-day work of individual electrical tradesworkers as directed.
—Actively engage in the installation, maintenance and repair of electrical systems equipment, tools, fire alarms, intrusion systems, alarm systems of all types.
—Carry out other duties in any trade as may be assigned.

Electrical Tradesworker

Function:

The Electrical Tradesworker is a journeyman electrician hired to do all repairs and preventive maintenance primarily to electrical systems and equipment in the school district. The Electrician shall work under the supervision of the Electrical Foreman or the Asst. Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—To install, replace or repair all electrical installations and equipment in the school district.
—To repair electrical tools and equipment as directed.
—To test fire alarms and intrusion systems, and repair same.
—To install and repair all lighting and power systems as used in school classrooms, gymnasiums, auditoriums and stages.
—To repair and maintain all ancillary equipment associated with these systems including blocks, pulleys, ropes, winches, etc.
—Carry out other duties in any trade as may be assigned.

Plumbing Tradesworker

Function:

The Plumbing Tradesworker is a journeyman plumber hired to do installations, repairs, and preventive maintenance to plumbing facilities, fire and field sprinkler systems in the school district. The plumbing tradesworker shall work under the supervision of the Asst Director of Buildings and Grounds, or in his or her absence the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—To be on call for water leaks and sprinkler problems.
—To install and maintain all district owned field and building sprinkler systems.
—To install, maintain, and repair sewer, water and hot water systems, toilets, showers, and piping and associated equipment.
—To carry out other duties as may be assigned in any trade.

Heating and Air Conditioning Serviceman

Function:

To maintain the heating and air conditioning equipment in each building so that full educational use of them may be made at all times. Works under the supervision of the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—On 24-hour call, available at any hour of the day to handle emergencies due to the breakdown of heating and/or air conditioning equipment.
—Establishes and carries out, on a regular basis, a preventive maintenance program for all district heating and air conditioning equipment.
—Orders materials and develops inventory of repair parts.
—Establishes priorities with the Director of Buildings and Grounds.
—Conducts inservice for the district maintenance and building supervisors on preventive maintenance techniques.
—Advises on qualifications for hiring contractors for major repairs.
—Supervises assigned task force personnel, HVAC helpers, and/or maintenance repair workers under the direction of the Director of Buildings and Grounds.
—Trains assigned HVAC servicemen helpers as directed by the Director of Buildings and Grounds.
—Performs other duties as assigned.

Heating and Gasfitter Tradesworker

Function:

The Heating and Gasfitter Tradesworker is a journeyman gasfitter hired to do all repairs and preventive maintenance to heating plants and gas appliances in the school district. The Gasfitter shall work under the supervision of the Asst. Director of Buildings and Grounds, or in his or her absence to the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—To repair and maintain all gas, oil and propane fired equipment and boilers, hot water tanks and all associated equipment.

—To install gas piping.
—To install and repair hot water piping, vents, heating equipment and radiators.
—Insure compliance with all applicable codes.

Grounds Supervisor

Function:

The Grounds Supervisor shall be responsible for the improvement, repairs and maintenance of all school district grounds and equipment installed at each site. The Grounds Supervisor shall assume management responsibility for the grounds crews and all material required by his or her department, development of the budget for his department, and the supervision of employees in other sections as directed by the Director of Buildings and Grounds. The Grounds Supervisor shall work under the supervision of the Director of Buildings and Grounds, or in his or her absence the Asst. Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Assumes responsibility for grounds development and maintenance, and related personnel. Assists in the development of, and insures observation of related policies, procedures and standards.
—Plans, schedules, and monitors the work done by the grounds crews and gardeners.
—Determines which work is to be done by outside contractors, and coordinates such work.
—Recommends to the Director of Personnel and Director of Buildings and Grounds personnel for hiring.
—Evaluates and recommends termination or promotion of grounds personnel.
—Examines fields, equipment including vehicles regularly to plan and implement preventive maintenance and safety measures (removal of windfalls, dangerous branches, filling holes, cleaning drains, etc.)
—Represents management at the first level of the grievance procedure, and advises negotiation committee on grounds matters.
—Insures that materials and equipment are carefully scheduled for the start of development and maintenance projects.

Grounds Lead Hand

Function:

The Grounds Lead Hand is directly responsible for the supervision of those people who do the improvement, repair, and maintenance work on all school district grounds. The Grounds Lead Hand shall work under the supervision of the Grounds Supervisor, and in his or her absence the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Schedules work for the grounds crew, day-to-day in advance. Assists in the work of the crew after initial instruction.
—Supervises and lays out work for machine operators and laborers, and monitors completion of projects.

—Prepares and maintains records related to day-to-day work done and working hours for all crew.
—Assists Grounds Supervisor in estimating, layout of projects and planning, organizing and programming.
—Makes decisions regarding the maintenance of lawns, grounds and all-weather fields.
—Checks safety of walks, steps, paths, fences, back-stops and around school sites and reports all bad conditions to Grounds Supervisor and to Principals for requisitioning major work.
—Performs semi-skilled duties in maintaining and repairing piping, fittings in water system for irrigation purposes, drain pipes, etc. and cleans, adjusts and opens drains and other lines.
—Operates machines and uses ground tools.
—Assists in installation of and repair to irrigation, drainage, black-topping and grounds equipment.
—Checks and cares for tennis courts, running tracks, jumping pits, basketball, baseball diamonds, fencing, back-stops, blacktop, draining, etc.
—Maintains an inventory of tools, equipment and material and insures that all equipment is in good repair and properly put away after use. All machinery to be left in good working order after use.
—Arranges for prompt repairs to equipment.
—Supervises snow removal, sanding and salting.
—Performs rough carpentry work.
—Does weekly field inspections and keeps up-to-date field reports regarding condition of fields, closures, etc.
—Does monthly playground equipment inspection reports and keeps up-to-date records of these inspections and repairs done or required.
—Performs other duties as assigned.

Grounds Utility Worker

Function:

The Utility Worker does safety inspections, repairs and preventive maintenance to all playground equipment and goal posts on school grounds, and works with the grounds crew as assigned. The grounds utility worker works under the supervision of the Grounds Supervisor, or in his or her absence the Grounds Lead Hand in the area assigned. When safety inspections and repairs are complete, works under the direction of Lead Hand in the area assigned.

Characteristic Duties and Responsibilities:

—Inspects all playground equipment in the sequence scheduled.
—Repairs playground equipment as required.
—Keeps accurate inspection reports, and maintains records related to day-to-day work done.
—Installs new equipment as directed.
—Works with the grounds crew on duties assigned by Lead Hands.
—Installs and removes tennis nets in season.
—Does preventive maintenance to equipment such as greasing, painting, replacing worn parts, etc.
—Performs other duties as assigned.

Gardener - Tradesworker

Function:

The Journeyman Gardener does planting and maintenance of shrubbery, trees, and flowers in and around school district buildings and controls weeds. The Gardener - Tradesworker shall work under the supervision of the Grounds Supervisor, or in his or her absence the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Prunes, trims and cultivates.
—Plants shrubbery, trees, flowers.
—Sprays pesticides and weed killer to insure plants are free from disease while carefully observing directions to protect the children.
—Assists in planting new grass fields.
—Works with Grounds Supervisor in planting new areas.
—Instructs and guides summer student clean-up crews.
—Instructs and guides laborers as assigned.
—Maintains records related to daily work done, vehicles, tools, etc.
—Waters all shrubbery as required.
—Maintains an up-to-date pesticide applicators license and follows all safety precautions.
—Performs other duties as assigned.

Casual and Regular Staff Grounds Laborers

Function:

Semi-skilled laborers hired for a number of miscellaneous jobs pertaining to the maintenance of school grounds and equipment. Grounds laborers shall work under the supervision of the Gardener or Lead Hand in charge of their designated area as assigned or in his or her absence the Grounds Supervisor.

Characteristic Duties and Responsibilities:

—Repairs fencing, drainage, playground equipment, backstops, goal posts, grass fields, all weather fields, etc.
—Installs new fences, drainage, backstops, equipment, goal posts, under the direction of supervisor.
—Cleans black top, walkways, shrubbery, stairs, roofs, etc.
—Loads, unloads vehicles.
—Removes snow, spreads salt and sand.
—Operates trucks and machinery as required.
—Cuts, trims, grass and weeds.
—Aerates, limes, fertilizes and top dresses.
—Cleans out underbrush, cuts down trees, burns/removes trash.
—Assists other trades and does other semi-skilled work as assigned.
—Responsible for minor greasing and oiling of equipment.
—Reports any loss or damage to equipment immediately to Lead Hand.
—At times carries out routing tasks on own or with other workers without supervision.
—Uses all necessary safety precautions to protect self and the school children,

such as shutting off rotary mowers at recess, lunch time and whenever children are near, and taking up other duties like cleaning and weeding.
—Performs other duties as assigned.

Summer Laborers (Students)

Functions:

Summer student laborers do weeding and cleaning of shrubbery, court yards, and blacktop areas of school sites during June, July and August. They work under the supervision of the Gardener or the Lead Hand in charge of the area, as assigned.

Characteristic Duties and Responsibilities:

—Cultivates and weeds shrubbery beds including interior court yards.
—Removes weeds growing through and around hard surfaced areas, including running tracks.
—Sweeps and cleans courtyards, parking areas, walkways and steps.
—Assists in loading and unloading of material such as branches, leaves, weeds and garbage.
—Performs various unskilled tasks that may be assigned.
—Uses safety precautions to protect self and school children, such as shutting off rotary mowers at recess, lunch time and whenever children are near, and taking up other duties like cleaning and weeding.

Machine Operators I and II

Function:

The Machine Operator II operates a tractor, post hole digger, roto tiller attachments and similar equipment.

The Machine Operator I operates grass mowers, trimmers and smaller equipment as necessary.

Both work under the supervision of the Lead Hand in the assigned area, and in his or her absence the Ground Supervisor.

Characteristic Duties and Responsibilities:

—Operates machines as scheduled by Lead Hand or Grounds Supervisor.
—Maintains daily log of operation based on the operating schedule identified, which is turned in to the Lead Hand monthly.
—Keeps a machine log showing gas purchased, oil used, repairs made and problems requiring attention using vehicle report sheet, which is turned in to the Lead Hand monthly.
—Keeps machines clean and operating safely and efficiently and reports *immediately* any malfunctions or preventive maintenance needs to the Lead Hand.
—Takes particular care and uses good judgment to avoid endangering children, before and after school, at noon and at recess, by stopping rotary mowers and avoiding driving near school buildings during those times, if children are near, and doing alternative grounds work.
—Performs assigned work when not required to operate machines.

Paint Supervisor

Function:

The Paint Supervisor shall be responsible for painting maintenance and renovations of all district school buildings and equipment. The Paint Supervisor shall work under the supervision of the Director of Buildings and Grounds, or in his or her absence the Asst. Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Assumes responsibility for the sanding and refinishing of gym floors, safety conditions on shop floors, installing of carpet, vinyls on walls, painting interior and exterior of schools.
—Determines which repair jobs may be performed by crews and which must be performed by outside contractors, and advises the Director of Building and Grounds.
—Supervises the painting repair work done by district staff, or contractor as appropriate.
—Instructs maintenance workers in the proper method of procedures and proper use of tools used in the trade.
—Recommends supplies and equipment for purchase, and maintains the inventory of district owned tools, equipment and supplies in his or her department.
—Estimates costs of painting projects in terms of labor, material and overhead for the annual budgeting.
—Examines district owned facilities on a regular basis for the purpose of preventive maintenance.
—Recommends hiring of temporary and regular staff to the Director of Personnel. Determines retention or release of probationary staff.
—Represents management at the first level of the grievance procedure and advises negotiation committee on matters related to carpentry.
—Performs other duties as assigned.

Lead Hand Paint Tradesworker

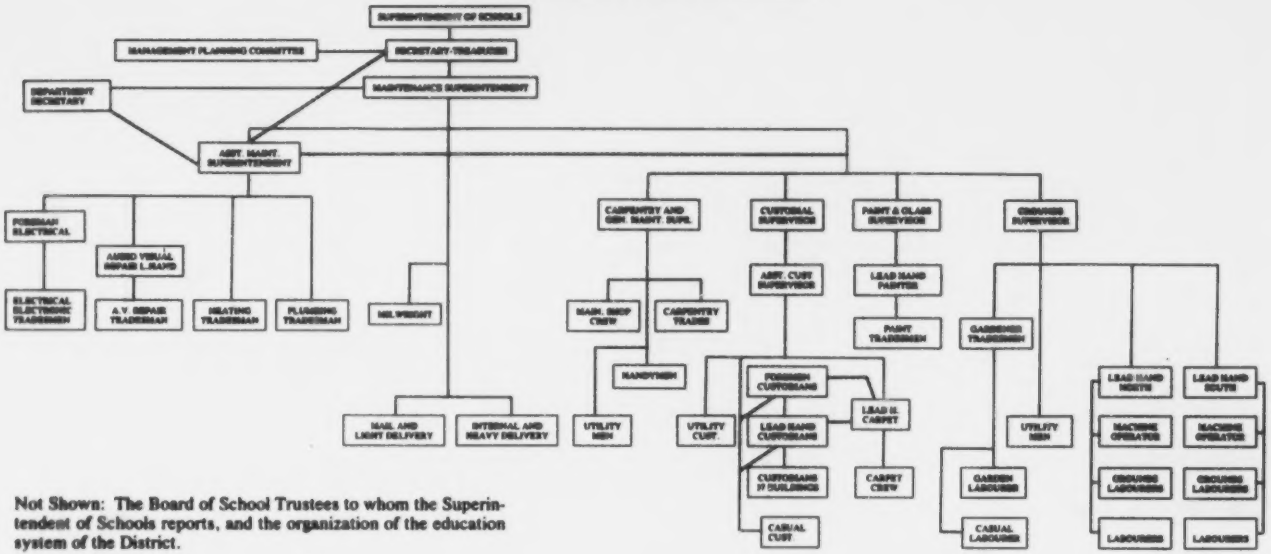
Function:

The Lead Hand Tradesworker is a journeyman painter hired to do all painting, paper hanging, installation of wall carpets and any other duties as required. The Lead Hand Painter shall work under the supervision of the Paint Supervisor, or in his or her absence the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Acts as a working lead hand to direct, supply paint and color schedules to crews as directed by Paint Supervisor.
—Does exterior and interior repainting and new painting as required.
—Does any touch-up painting.
—Removes graffiti either by painting or removing with materials supplied.
—Installs wallpaper or carpet to interior walls as required.
—Paints exterior playground equipment and roof top equipment.
—Paints game lines and parking lines, and parking lines on blacktop.
—Installs game lines to gym floors.
—Installs safety treads around shop equipment.

ORGANIZATION CHART
LARGE SIZE SCHOOL DISTRICT
FACILITIES MANAGEMENT DEPARTMENT ORGANIZATION CHART



Not Shown: The Board of School Trustees to whom the Superintendent of Schools reports, and the organization of the education system of the District.

*The Management Planning Committee includes the Assistant Superintendents, Director of Management Services, Secretary-Treasurer and the Superintendent of Schools and provides the coordination required to guide the organization toward its overall goals.

Dotted lines indicate reporting relationships in absence of Maintenance Superintendent, and reporting relationships for people temporarily assigned to clean schools.

Courtesy: School District #37, Delta, B.C.

—Repairs and installs vinyl wall coverings.
—Installs plastic floor finisher to gym floors.
—Cleans and safely stores paint equipment at the end of each day.
—Stores all flammable paint supplies in proper fireproof container after use.
—Uses all necessary safety equipment when required.
—Carries out other duties as assigned.

Painter Tradesworker

Function:

The Painter Tradesworker is a journeyman painter hired to do painting, paper hanging, installation of wall carpets and any other duties as required. The painters shall work under the supervision of the Lead Hand Painter or Paint Supervisor as appropriate.

Characteristic Duties and Responsibilities:
—Does all exterior and interior repainting or new painting as required.
—Does any touch-up painting.
—Removes graffiti either by painting or removing with materials supplied.
—Installs wall paper or carpet to interior walls as required.
—Paints exterior playground equipment and roof top equipment.
—Paints game lines and parking lines, and parking lines on blacktop.
—Installs game lines on gym floors.
—Installs safety treads around shop equipment.
—Repairs and installs vinyl wall coverings.
—Installs plastic floor finisher to gym floors.
—Cleans and safely stores paint equipment at the end of each day.
—Stores all flammable paint supplies in proper fireproof container after use.
—Uses all necessary safety equipment when required.
—Carries out other duties as may be assigned in any trade.

Lead Hand Audio Visual Technician

Function:

The Lead Hand Audio Visual Technician is in charge of Audio Visual Tradespersons and the repair/maintenance of all audio visual and alarm systems. The Lead Hand Audio Visual Technician shall work under the supervision of the Asst. Director of Buildings and Grounds, or in his or her absence the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Assigns work to the Audio Visual crew.
—Insures that the audio visual repair and maintenance schedule is maintained.
—Assists the audio visual crew to repair and maintain equipment.
—Maintains, programs, and repairs alarm systems, computers and components of computers.
—On call for security problems with fire and alarm systems.
—Schedules fire alarm system batteries and maintenance checks in conjunction with regular intrusion system maintenance.

—Advises management when equipment is unrepairable and should be replaced.
—Performs other duties in any trade as may be required.

Audio Visual Technician

Function:

The Audio Visual Technician is hired to do repair of electronic equipment and other equipment as directed. The Audio Visual Technician will work under the supervision of the Lead Hand Technician, and in his or her absence the Asst. Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Responsible for the repair, maintenance or modification of all district audio visual, video recording and playback equipment, school sound and PA systems, theatre and auditorium sound and lighting systems, intrusion, fire detection systems, and energy management equipment, and maintenance of district owned telephones and associated equipment; basic computer installation.
—Advises management when equipment is unrepairable and should be replaced.
—Performs other duties as assigned to assist and facilitate the work of other trades and promote the advancement of education.

Maintenance Utility Worker

Function:

Utility workers I and II work under the supervision of the Director of Buildings and Grounds, or in his or her absence the Asst. Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

Utility worker I will be required to:

—Set up and organize own schedules to suit the requests for pick up and deliveries throughout the district.
—Keep a running inventory of all surplus furniture, desks, doors, etc. so that schools can be supplied as requested.
—Pick up and deliver large orders from wholesaler or other sources as required.
—Pick up and deliver materials to and from the Maintenance Shop.
—Substitute for mail delivery worker.
—Carry out other duties as may be assigned from time to time.

Utility worker II assigned to general duties will be required to:

—Assist any department as may be required from time to time; be assigned as a general helper when a trades worker is not required.
—Substitute for delivery van driver.
—Carry out other duties as may be assigned from time to time.

Mail, Pick up/Delivery Worker

Function:

A versatile person able to deliver/pick up mail, do minor purchasing and other duties as assigned. Works under the supervision of the Director of Buildings and Grounds.

Characteristic Duties and Responsibilities:

—Deliver mail to and from Board Office to schools/district offices/buildings on scheduled runs as assigned.
—Deliver mail to Board members/Trustees.
—All deliveries, regardless of internal or external, should be organized to minimize mileage and travelling time between calls.
—Make minor purchases as requested.
—Perform duties as assigned.

Maintenance Superintendent

Capsule Description: The Maintenance Superintendent shall be responsible for the maintenance, renovations and new construction of all Delta School Buildings and Grounds.

1. *The Reporting Relationship*
   Maintenance Superintendent shall report to the Secretary-Treasurer and in his or her absence to the Superintendent of Schools.
2. *Mandated Responsibilities:* The Maintenance Superintendent shall ensure that all Building Codes, W.C.B. Regulations, Health Regulations, Fire Regulations and Insurance Underwriters Regulations are adhered for maintenance, renovations or new construction on Delta School Buildings or Grounds.
3. The Maintenance Superintendent shall assume management responsibilities for:
   (a) All Divisions responsible for cleaning, maintaining and renovating of schools, equipment and grounds.
   (b) The development of preventative maintenance plans and the overall maintenance budget.
   (c) Balancing available staff among departments.
   (d) The development and maintenance of goals, objectives, supervision role descriptions, staff job descriptions, performance objectives and procedure manuals for maintenance.
   (e) Taking immediate action in emergent situations where time is of the essence without reference to senior management.
   (f) The prudent use of all resources.
4. Maintenance Superintendent shall sit on Union/Management Committee, and Union Negotiation Committee.
5. Major Duties:
   (a) Assigns work to supervisors of maintenance and inspects results.
   (b) Develops systems for dealing with emergency repairs.
   (c) Assigns work orders, checks drawings and plans.
   (d) Consults with building inspectors and obtains all building and inspection permits required.
   (e) Inspects schools and determines repairs and replacement needs. Recommends estimates and coordinates annual maintenance budget.
   (f) Estimates, recommends and supplies sketch drawings for minor renovations required. Consults with architects and engineers when necessary.
   (g) Works closely with Leisure Services on use of school buildings and playgrounds.

(h) Controls security of buildings for keying system and issue of keys and alarm keys.
(i) Works closely with Insurance Underwriters, W.C.B., and Fire department re fire and safety hazards in schools. Assigns crews to have any infractions repaired as soon as possible.
(j) Responds 24 hours per day to emergency situations.
(k) Makes final selection of all crafts people hired for the Facilities Management Department, in consultation with Personnel Manager.
(l) Assists in specifications and checking all quotes for the purchase of materials or services required by the Department.

6. Consulting Relationship: Consults with Principals, Insurance Underwriters, Architects, Engineers, Municipal Departments, W.C.B., Health Department, Management Supervisory staff and Suppliers regarding projects of Facilities Management Department.
7. The Maintenance Superintendent shall participate in the long- and short-range planning needs of the District by providing at the time of annual operating and capital budget development, a planning report to the Secretary-Treasurer on the specific needs of the maintenance system and the general needs of the District which have come to his or her attention through observation of operations.
8. The Maintenance Superintendent shall provide leadership and foster conditions in the areas under his or her line management which will promote conservation of resources and effective performance.
9. The Maintenance Superintendent shall carry out formative evaluation of the people under his or her line management based on jointly developed performance objectives both at the group and individual level. He or she shall endeavor to establish a rapport with staff which encourages two way communication, to develop and maintain role and job descriptions, procedure manuals, and goal-oriented performance objectives, to assist staff members to understand their value and purpose in the organization.
10. The Maintenance Superintendent Role description shall:
    (a) Be used as a reference to develop more specific goal-oriented performance objectives which will be used in a regular review and formative evaluation by and with the Secretary-Treasurer.
    (b) Be reviewed annually each April and redefined as necessary by the Secretary-Treasurer in consultation with the Maintenance Superintendent.

Courtesy: School District #37, Delta, B.C.

Assistant Maintenance Superintendent

Capsule Description: The Assistant Maintenance Superintendent shall be directly responsible for the Conservation, Electrical, Audio-Visual, Heating and Plumbing sections, and indirectly for the maintenance and renovation of all Delta School buildings and grounds. He or she will take over responsibilities for all divisions in absence of Maintenance Superintendent.

1. *Reporting Relationship*
   The Assistant Maintenance Superintendent shall report to the Maintenance Superintendent and in his or her absence the Secretary-Treasurer.

2. *Mandated Responsibilities:* Assistant Maintenance Superintendent shall ensure that all Environmental, Electrical, Gas, and Plumbing codes be adhered to when maintenance and renovations are done in school buildings.
3. The Assistant Maintenance Superintendent shall assume management responsibilities for:
   (a) The electrical, Electronic Security System, audio-visual, heating and plumbing development, maintenance and renovations required in schools, equipment and grounds.
   (b) Budgeting in these departments.
   (c) Conservation of energy throughout the system.
4. The Assistant Maintenance Superintendent to sit on the safety committee.
5. Specific duties:
   (a) Assumes primary responsibility for the safety condition of lighting fixtures, electrical apparatus, fixtures, wiring, air conditioning and refrigeration units, and other electrical equipment in the school buildings.
   (b) Assumes primary responsibility for district heating systems, boilers, roof-top units, forges and melting pots, and gas fired equipment in shops and cafeterias. Assumes primary responsibility for district audio-visual maintenance and repairs to equipment. Assumes primary responsibility for intrusion and fire alarm systems. Assumes duties of energy conservation officer. Assumes primary responsibility for plumbing.
   (c) Determines which repair jobs may be performed by crews and which must be performed by outside contractors, and advise Maintenance Superintendent.
   (d) Supervises the electrical, heating and plumbing work of the district.
   (e) Instructs maintenance workers in the proper method of procedure and proper use of tools.
   (f) Recommends supplies and equipment for purchase, and maintains the inventory of district-owned tools, equipment and supplies in his department.
   (g) Estimates costs of electrical, heating and plumbing repair projects in terms of labor, material and overhead for annual budgeting.
   (h) Examines district owned facilities on a regular basis for purpose of preventative maintenance.
   (i) Hires temporary and full-time staff in consultation with Personnel Manager. Determines retention or release of permanent staff in consultation with Maintenance Superintendent and Personnel Manager.
6. Consulting Relationship:
   Consults with Electrical Engineers, Gas Inspectors, Plumbing Inspectors, Principals and suppliers regarding needs of maintenance sections under his or her control.
7. The Assistant Maintenance Superintendent shall provide leadership and foster conditions in the sections under his or her line management which will promote conservation of resources and effective performance.
8. The Assistant Maintenance Superintendent shall carry out formative evaluation of the people under his or her line management based on jointly developed performance objectives both at the group and individual level. He or she shall endeavor to establish a rapport with staff which encourages two-way com-

munication, to develop and maintain role and job descriptions, procedure manuals, and goal-oriented performance objectives, to assist staff members to understand their value and purpose in the organization.

9. The Assistant Maintenance Superintendent's role description shall:
   (a) Be used as a reference to develop more specific goal oriented performance objectives which will be used in regular review and formative evaluation by and with the Maintenance Superintendent.
   (b) Be reviewed annually each April and redefined as necessary by the Maintenance Superintendent in consultation with the Assistant Maintenance Superintendent.

Courtesy: School District #37, Delta, B.C.

PREVENTIVE MAINTENANCE

Preventive maintenance usually insures that a piece of equipment functions optimally and, therefore, economically. The useful life of the equipment can often be extended as a result of proper maintenance. The small investment in maintenance is recovered many times over.

While it is easy to discuss the merits of a good preventive maintenance program, the installation of one is often difficult to accomplish and may well lack substance. It is recommended that, prior to the initiation of a program, a detailed inventory be done of each and every piece of equipment to be maintained. That inventory should identify the name of the unit, serial number, location, its use, information about its motor—horsepower, revolutions per minute, manufacturer, its belt size, if any, and the frequency of service that is needed.

The inventory should be placed on cards, sheets in a notebook or on a computer. The inventory sheet should also have a place to record the maintenance done on the equipment; the suggestion is that a multi-year form be developed. A record would then be available on each piece of equipment.

All too often the way in which the preventive maintenance is done is left to the individual doing the maintenance. It is suggested that a set routine be developed for servicing each piece of equipment. Once done, each and every individual working on the equipment should do the servicing the same way. The particular procedure should be identified on the inventory sheet so that the person servicing the piece of equipment will not have any question as to what is to be done.

This manual contains sample Preventive Maintenance Guides for different pieces of equipment. The Summary Sheet identifies the codes assigned to 57 various pieces of equipment and the recommended frequency of maintenance. It should be understood that these are routines that have been used by industry, the University City School District, University City, Missouri, and the United States Government, General Services Administration. It is suggested that you carefully review the procedures in order to assure that they are what you want done to your equipment.

At the end of this section are sample inventory sheets used in the University City School District. Note that at the bottom of the sheets are indications "Unit A-1 Annual," "Unit A-4 Annual," "Unit C-5 Annual." These "units" refer to the code designations given to the various procedures contained in the Preventive Maintenance Guides.

When a tradesworker approaches a piece of equipment, the tradesworker need only to look at the code designation for the piece of equipment, turn to the page in his or her book describing the specific procedure to be used, do it, and record on the inventory sheet that the work has been done. Management can rest assured that the equipment has been properly serviced.

The following Preventive Maintenance Guides—Summary Chart and detailed preventive maintenance guides which follow represent items generally found in school districts. The procedures that have been identified are generally accepted practices in industry, the federal government and school districts.

It is strongly recommended that the manufacturers' guidance be sought in the specific maintenance of specific equipment purchased through that manufacturer. Likewise, local and state ordnances need to be checked to assure compliance with

requirements, codes, etc. Also check warranties that accompany many pieces of new equipment.

Preventive Maintenance Guides Summary Chart

Code	*Item*	*Frequency*
A-1	Air Compressor	Semi-Annually
A-2	A/C Package Unit	Annually
A-3	A/C Package Unit (Computer room)	Monthly
A-4	A/C Window Unit	Annually
A-5	Air-Cooled Condenser	Annually
A-6	Heat Pumps	Annually
A-7	Air Handler Unit	Annually
A-8	Alarms	Quarterly
B-1	Boiler, Cast Iron and Steel	Annually
B-2	Burner, Gas	Annually
B-3	Burner, Oil	Annually
C-1	Clocks, Electric, Central System	Semi-Annually
C-2	Controls—Central System (HVAC)	Annually
C-3	Cooling Tower	Annually
C-4	Cooling Tower	As Required
C-5	Condensate or Vacuum Pump	Annually
D-1	Door, Power Operated	Semi-Annually
D-2	Drains, Roof, Gutter, Downspouts, etc.	Annually
D-3	Doors, Main Entrance	Semi-Annually
D-4	Drains, Areaway, Driveway, Storm	Annually
E-1	Elevators, Hydraulic	Monthly
E-2	Elevators, Hydraulic	Annually
E-3	Emergency Lights (Wet Cells)	Quarterly
E-4	Emergency Generators, Electric, Gasoline, Natural Gas Engines	Annually
E-5	Emergency Generator, Electric Diesel Power	Annually
E-6	Emergency Generators, Electric	Monthly
F-1	Fire Hose (1'–½", Racked in Bldg)	Annually
F-2	Fire Department Hose Connections	Annually
F-3	Fire Department Pumper Connections (standpipe or sprinkler)	Annually
F-4	Fire Doors—Stairwells and Exitways (swinging)	Quarterly
F-5	Fire Doors—Sliding Type	Quarterly
F-6	Fire Alarm Boxes (Manual)	Quarterly
F-7	Sprinkler Heads—Sprinklered Areas	Annually
F-8	Fire Extinguisher—Soda Acid or Foam	Annually
F-9	Fire Extinguisher—Stored Pressure with Gauge	Annually
F-10	Fire Extinguisher—Gas Cartridge or Cylinder (no gauge)	Annually
F-11	Fan—Centrifugal	Annually
F-12	Fans—Propeller, 24" Diameter or Larger	Annually
G-1	Grease Traps	Monthly
H-1	Hot Water Heaters and Converters	Annually
H-2	Hot Water Heater—Gas	Annually
H-3	Hot Water Heater—Electric	Annually

Preventive Maintenance Guides
Summary Chart con't.

Code	*Item*	*Frequency*
I-1	Incinerator	Annually
I-2	Induction Units—Under Window Type	As Required
L-1	Lawn Mowers and Edgers	Every 50 working hrs
L-2	Lawn Sprinklers	Annually
M-1	Motors	Annually
R-1	Radiators—Heating	Every 5 years
R-2	Roof Inspection	Semi-Annually
R-3	Refrigeration Machine (centrifugal & reciprocating)	Annually
S-1	Sump Pump	Annually
T-1	Tanks, Water (all types)	Every 3 years
T-2	Tanks, Fuel Oil Storage	Every 4 years
T-3	Traps, General, Thermostatic, Bucket, Impulse	Low press—every 3 yrs High press—annually
U-1	Unit Heaters, Steam and Hot Water	Annually
U-2	Unit Heaters (gas fired)	Annually
V-1	Valves, Regulating	Annually

Preventive Maintenance Guides

A-1 Air Compressor **Frequency: Semi-Annual**

Special instructions. Review manufacturer's instructions.

Check points.

1. Perform normal tour checks and operations.
2. Change compressor crankcase oil.
3. Clean air intake filter.
4. Check air dryer for proper operation. Clean condenser coils and cover grills.
5. Inspect belt alignment and condition. Adjust or replace belts as required.
6. Check for corrosion on water cooled units.
7. Clean heat exchanger surfaces.
8. Check accuracy of gauges with calibrated test gauge.
9. On two stage compressor, check intermediate pressure.

A-4 Air Conditioning Window Unit **Frequency: Annual**

Special Instructions. Disconnect electric cord to unit. Review manufacturer's instructions.

Check points.

1. Clean condenser, cooling coil fins and fans.
2. Remove dirt or dust from all interior parts.
3. Replace filter.
4. Inspect and adjust damper.
5. Lubricate motor and fan bearings.
6. Inspect gasketing. Look for leaks between unit and window, caulk as necessary.
7. Check for refrigerant leaks.
8. Start unit and observe operation.
9. Check temperature differential and controls.
10. Check frame of unit with ohmmeter for proper electric ground.
11. Replace covers (if any).
12. Clean area.

B-1 Boilers, Cast Iron and Steel **Frequency: Annual**

Special Instructions. Review manufacturer's instructions and ASME Code for boilers. If boiler is part of an operating system, blanks should be installed to isolate the boiler from the system.

Check points.

1. *General*
   a. Blow down boiler heavily before removing "from the line."
   b. Remove fly ash and soot from flue passages.
   c. Gag safety valves.
   d. Fill boiler and apply hydrostatic test, 1½ times the operating pressure.
   e. Check fire sides, valves, and trim and mark position of leaks.
   f. Drain boiler, take proper safety precautions before sending man into boiler, including tagging of valves and controls, and letting boiler cool down.
2. *Water sides.*
   a. Remove hand hold and manhole plates.
   b. Clean interior of boiler, wash down shell and drums to remove mud, loose scale, and deposits.
   c. Turbine tubes, check tube ends for leakage and corrosion. Re-roll, rebead, and/or replace thin tubes.
   d. Examine complete water side for extent of corrosion, measure and record the location and depths of pits in drum internals, and feed connections, gauge glass, and steam pressure gauge outlets.
   e. Clean gauge glass and siphon loops to limit controls.
   f. See that pet cocks and try cocks open freely.
   g. Boilers should be tested hydrostatically at 1½ times their working pressure and lifted by steam when the boiler is first placed on the line.
   h. Calibrate pressure and temperature gauges.
3. *Exterior and fire sides.*
   a. Examine and clean water column and feed water regulators, high and low side alarms, drains, gauge glasses, siphon loops, pet and try cocks.
   b. Look for signs of overheating, leakage, wear, abrasion, corrosion of pressure parts, or erosion of metal.

c. Check tubes for evidence of blisters and pock marks.
d. Check condition of all refractories for cracks, erosion and caulk. Also expansion joints, baffles, dampers and actuating mechanisms, staybolts, etc.
e. Check sootblower elements for misalignment, warping, and impingement on tubes.
f. Test all non-return and stop valves, clean and replace as necessary.
g. Check and clean bonnets, flues, uptakes, for defective metal. Replace if necessary.
h. Check fusible plugs if used, replace yearly.
i. Check exterior structure for strains and tension.
j. Clean and lubricate forced draft fan.
k. Check condition of door gaskets.
l. Carefully account for all tools before closing up boiler.

C-5 Condensate or Vacuum Pump **Frequency: Annual**

Special instructions. Review manufacturer's instructions.

Check points.

1. Operate unit to check for steam binding.
2. Check condensate temperature (should be approximately 30 Deg. below steam temperature if traps are not leaking.)
3. Examine flanges for steam leaks.
4. Pump receiver down.
5. Turn condensate to sewer.
6. Shut down unit.
7. Clean receiver.
8. Clean and adjust motor float switch and float operation on high low water level. Inspect pressure switches.
9. Clean and examine receiver, vent pipe, inlet and discharge openings for excessive corrosion. Report condition.
10. Check alignment of coupling with straight edge.
11. Lubricate pump and motor.
12. Adjust packing glands and change packing when necessary.
13. Examine vacuum breaker operation.
14. Inspect ball floats, rods and other linkage, adjust as necessary.

D-3 Doors, Main Entrance **Frequency: Twice Annually**

Application. Entrance doors used in main entries to building where a poorly operating door may be dangerous and cause congestion.

Check points. (For hinged doors)

1. Inspect the frame and supporting structures.
2. Inspect hardware: hinges, latch keeper, lock, etc. Apply graphite where needed, wipe off excess.
3. Inspect glass, putty or retaining pieces. Correct any deficiencies.
4. Operate door to observe functioning of check. Adjust and service as needed.
5. Touch up paint as needed.

E-6 Emergency Generators, Electric **Frequency: Monthly**

Special Instructions. Check fire extinguishers for location and type. Allow no open flames or smoking in the area. Use only approved safety type fuel cans. Obtain and review manufacturer's instructions and specifications.

Check points.

1. Drain condensate from bottom of fuel tank and check fuel for quantity and contamination.
2. Check engine oil level.
3. Check coolant level and inspect for leaks. Inspect engine air cleaner, replace if dirty.
4. Test and determine specific gravity of starting batteries. Clean terminals. Set proper charge rate after generator has been operated.
5. Examine generator for moisture and/or dirt.
6. Start and operate unit under full load for one hour. It is important that the unit be operated under load. If a portion of the building load cannot be connected, a resistance load should be used.
7. While unit is operating, thoroughly observe operation for indication of defects or possible malfunctions.
8. After unit has operated for 50 minutes, log the operation to show at least the following information: engine and generator speed in R.P.M.; operating voltage; operating amperes; engine temperatures; engine oil pressure; hour meter readings.
9. After unit has been operated, check lubricant and coolant according to manufacturer's instructions to assure that it will be ready to operate in an emergency.

F-7 Sprinkler Heads—Sprinklered Areas **Frequency: Annual**

Special instructions. This work should be scheduled immediately prior to the scheduled maintenance on dry pipe valves or alarm check valves (wet pipe). Needed replacement of sprinkler heads should be performed at that time (R&I).

Check points.

1. Inspect and identify damaged, bent, corroded, painted, whitewashed, or weeping sprinkler heads, all of which will need replacement.
2. Remove any insect nests attached to sprinkler heads.
3. Place light coat of oil on sprinkler heads located in areas conducive to insect nests.
4. For sprinkler heads which are subject to above normal temperature (adjacent to steam pipes, furnaces, ovens, hot gas, vents, exhaust, etc.), check color coding of sprinkler heads for the proper temperature range. Identify the sprinkler heads with improper ranges, all of which will need replacement.
5. Check that minimum distance of 18 to 36 inches is maintained between sprinkler heads and racks, palletized stock, or other stacked materials.
6. Remove any ladders, stock or material which is being supported by the sprinkler piping.
7. Replace broken pipe hangers and refasten any that have come loose.
8. Make sure sprinkler heads are in upright or pendant position.
9. Check that all water is drained from low points on dry piping systems.

H-2 Hot Water Heater—Gas **Frequency: Annual**

Special Instructions. Review manufacturer's instructions.

Check points.

1. Drain several gallons from tank to remove sediment.
2. Manually check operation of safety valve. Check for corrosion.
3. Check all connections—electric, gas and water. Tighten as necessary.
4. Check operation and setting of aquastat. Check hot water temperature with dial thermometer, and set aquastat at minimum value.
5. Check pilot and burner assembly. Clean and adjust nozzles for proper flame distribution and quality.
6. Check operation of electric ignition device, if applicable. Check spark gap and adjust if needed.
7. Check flue for proper draft, leaks, and corrosion. Check thermocouple for corrosion or soot. Clean if required.

M-1 Motors **Frequency: Annual**

Special Instructions. Open and tag circuit serving motor. Obtain and review manufacturer's instructions. Give special attention to lubrication procedure as well as brush and commutator maintenance.

Check points.

1. Clean motor with a clean rag or vacuum. Clean areas otherwise inaccessible by blowing with *clean dry* air using not more than 40 pounds per square inch pressure. Clean surfaces and ventilation passages thoroughly.
2. Visually inspect winding for cleanliness. Look for coating of oil or grease (disassembly of a motor for cleaning is normally beyond the scope of preventive maintenance).
3. Check and report defective bearings for replacement.
4. Inspect squirrel-cage rotors for broken or loose bars and evidence of local heating.
5. On wound-rotor and synchronous motors, thoroughly clean the collector rings and/or commutators. Inspect them for roughness and eccentricity. Examine brushes for fit, free play, chipped toes or heels, heat cracks, wear and contact pressure.
6. Perform lubrication according to manufacturer's instructions.
7. Inspect for moisture and protection from water.
8. Check motor mountings, supports, and couplings for tightness or other defects.
9. Remove tags and return unit to service.
10. Read load on motor at no load and/or full load and record on preventive maintenance control card.

U-2 Unit Heater (Gas Fired) **Frequency: Annual**

Special instructions. Review manufacturer's instructions.

Check points. Open and tag electric circuit.

1. Clean and adjust heater deflector fins and elements.

2. Clean fan and lubricate motor.
3. Clean burner, chamber, thermocouple and control. (Use a high suction vacuum and/or brush).
4. Adjust pilot or electric ignition device.
5. Inspect vent and damper operation.
6. Operate unit and adjust burner.
7. Check operation of safety pilot, gas shut-off valve, and other burner safety devices.

V-1 Valves, Regulating **Frequency: Annual**

Special instructions. Review manufacturer's instructions.
Application. Single or double seated; diaphram or spring loaded, pilot operated valves.

Check points.

1. Clean strainer ahead of valve.
2. Check valve head and seats for wear or cuts.
3. Replace valve if seats need regrinding and have valve overhauled by manufacturer.
4. Examine steam quality for foreign matter if valves are damaged.
5. Examine pilot lines for dirt.
6. Check steam gauges.
7. Check diaphrams for failures.
8. Check binding valve stem.
9. Adjust weighted lever or spring control tension.

Work Order System

In order to assure that items that need to be done are in fact done in a timely manner, and in order to cost out the work that was done, it is necessary to institute a work order system.

A practice has been to design a four-part form with the initiator of the form keeping one copy; the three others are forwarded to the maintenance department. The Director of Buildings and Grounds, or designee, reviews the work orders and prioritizes them. They are then assigned to the appropriate maintenance department employee. The individual doing the repair, get a copy of the work order. That copy (work copy) is completed when the job is done and brought back to the maintenance office, filled out by the maintenance department employee to the extent the employee is able to fill out the form.

The Director of Buildings and Grounds, or designee, completes the form as to time, materials, costs, etc., and returns a copy of the completed work order to the initiator. The maintenance department keeps one copy in its permanent file.

Emergencies requiring immediate action do not fall within the constraints of the formal work order system. Usually, the initiator calls the maintenance department, indicates the emergency, the matter is acted on, taken care of, and the formal work order form is completed for the records.

A numbering system often enables the Director of Buildings and Grounds to maintain close tabs on the flow of work. Maintaining a log indicating to whom the work is assigned and the progress made is essential.

See sample work order forms in Appendix 2.

Summer Maintenance

In scheduling annual preventive maintenance for the district, it needs to be noted that certain areas lend themselves to maintenance during the summer months when school is not in session and the equipment/facility is not used on a day-to-day basis. Examples of this are the home economic and industrial arts/vocational education lab areas, the gymnasium bleachers, etc.

Although visual inspections should be done on a regular basis, and work orders monitored for possible deterioration in the equipment, preventive maintenance is best carried out in the summer months.

Specific procedures need to be identified so that, regardless of who does the maintenance, it is done according to district approved standards. An example of this follows:

GYM BLEACHERS

Preventive maintenance is to be carried out on all gym bleachers during the summer vacation. A visual inspection shall be done of all supports, braces, nuts, bolts, etc., to ensure that there is no wear, cracks, or missing parts. All wheels and movable parts are to be cleaned and greased. On completion of maintenance, check units for free and easy operation.

(Courtesy: School District #37, Delta, B.B.)

See section on Preventive Maintenance Guides for additional specific procedures for accomplishing the preventive maintenance function in various areas.

Painting

It is advisable to devise a painting cycle whereby school interiors would routinely be painted on a cyclical basis, every six to seven years. It is anticipated that a good grade of paint would be put on so that it could be washed and touched up as needed to extend the life of the paint job. It is recognized that, as necessary, rooms or sections of a building may have to be painted more frequently.

The use given to a particular area of the building, to include community use of the school facility, will have a bearing on the frequency of the painting for that area.

The exterior of the building's need to be painted will to a large extent depend on its exposure to the elements. Here, too, a cycle should be established so that planning can be done to make certain that the funding is there for the painting to be done. Ongoing inspection of the exteriors of the buildings will assist the Director of Buildings and Grounds in determining the work that has to be done. In a district where all things are equal, the exterior painting cycle should be completed in a six to seven year time frame.

The selection of colors for the interior painting can at times be a problem. Where districts have adopted a policy statement/regulation as to the choice of colors available, there is far less problem with the matter of choice. See Interior Painting Guidelines in this section.

Interior Painting Guidelines

The following are preliminary guidelines covering the standardization of painting of the interior of the district's school buildings.

Building principals are to initiate requests for special painting only after reviewing the long-range plans for painting all district buildings. All special painting requests should be submitted in February. This does not include painting necessary to repair damage to the buildings as a result of leaks and the like.

1. There will be six (6) basic colors available for selection:
   a. blue - lt. pastel
   b. green - lt. pastel
   c. brown - lt. pastel
   d. yellow - lt. pastel
   e. white
   f. off white

   The selection of basic colors has been made in an effort to effect economies of scale in the purchase of paint, ability to match colors and do repair work, and capitalize on the reflective properties of certain colors to reflect light rather than absorb light resulting in energy savings.

   These colors will be available in both a flat eggshell finish and in enamels. The flats are to be used for plastered, plasterboard-wood, etc., walls. The enamels for trim work, wainscotings, and the bottom four to five feet of walls in corridors.

2. Accent colors may be used within a room but must be limited to no more than 10% of the total wall space being painted.

3. One wall of a room may be painted a slightly darker shade than the rest of the walls. This application, however, must be approved by both the principal and the Maintenance Department. The Maintenance Department will be stocking the base color, the color requests will be filled by tinting the base color within the Maintenance Department.

It is recognized that in some cases, due to the color combination currently in existence in the decor, such as floor and wall tile, some variations of the standard colors may be necessary. We will accommodate these on an individual basis.

The basic plan for interior painting is once every six years. This will be implemented once the "catch-up" painting is completed to accommodate past leaks, breaks, malfunctions, etc.

Your understanding is appreciated.

Sample Inventory Sheets

SERVICE SYSTEMS CORPORATION
ENGINEERING DIVISION
PREVENTIVE MAINTENANCE

Location: Senior Boiler Room
Used for: Pneumatic Controls

Motor HP: 2
RPM: 1740
MFGR: Westinghouse
Belt Size: B79

Frequency of Service: Continuous
Unit: Air Compressor S/N 5501

	19	19	19	19	19	19
JAN						
FEB						
MAR						
APR						
MAY						
JUNE						
JULY						
AUG						
SEPT						
OCT						
NOV						
DEC						

NOTE: CHART TO BE INITIALED AND DATED BY PERSON COMPLETING SERVICE.
OBSERVE AND CLEAN AS FOLLOWS: Operation—check weekly, check belt tension, oil level, lubricate as needed.
Unit A1 annual

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SERVICE SYSTEMS CORPORATION
ENGINEERING DIVISION
PREVENTIVE MAINTENANCE

Sample Inventory Sheets

Location: Senior
Used for: Cooling Room 3

Motor HP: 115-12 AMPS
RPM:
MFGR: Frigidare
Belt Size:

Frequency of Service: Continuous
Unit: Window A/C
S/N 10492080
M/N-ACD-10WB

	19	19	19	19	19	19
JAN						
FEB						
MAR						
APR						
MAY						
JUNE						
JULY						
AUG						
SEPT						
OCT						
NOV						
DEC						

NOTE: CHART TO BE INITIALED AND DATED BY PERSON COMPLETING SERVICE.
OBSERVE AND CLEAN AS FOLLOWS: Operation—check filters, clean as needed.
Unit A4—annual

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Sample Inventory Sheets

SERVICE SYSTEMS CORPORATION
ENGINEERING DIVISION
PREVENTIVE MAINTENANCE

Location: Senior
Used for: Steam Return
Motor HP: 5
RPM: 1740
MFGR: General Electric
Belt Size:
Frequency of Service: Continuous
Unit: Vacuum Pump 65A217

	19	19	19	19	19	19
JAN						
FEB						
MAR						
APR						
MAY						
JUNE						
JULY						
AUG						
SEPT						
OCT						
NOV						
DEC						

NOTE: CHART TO BE INITIALED AND DATED BY PERSON COMPLETING SERVICE.
OBSERVE AND CLEAN AS FOLLOWS: Operation—check monthly lubricate as needed.
Unit C5—annual

SSC 353 (04/79)

ENERGY CONSERVATION

Energy conservation programs within districts will only come to pass with the identification of guidelines which, if followed, will generally effect savings for the district.

Following are the Prescriptive Standards of the U.S. Department of Energy, as adopted by the Valley View Schools 365/U, Romeoville, Illinois.

The General HVAC Rules are:

Rule 1—Heating/Cooling Temperatures
Rule 2—Heating-Cooling-Ventilation Levels and Recommended Supporting Practices
Rule 3—Domestic Hot Water Temperatures

The General Lighting Rules are:

Rule 1—Lighting Levels
Rule 2—Recommended Procedures

It should be noted that there are many programs being sold by outside contractors which claim that they can reduce the costs of energy consumption. In evaluating the benefits of such a contractual relationship, care needs to be taken to assure that you are not trading dollars in the process.

Many districts are purchasing their own capability to monitor energy consumption and control costs. They have found that they do far better than instances where a major cost of contracted energy management services go for long distance telephone lines.

General HVAC Rules

Rule 1—Heating/Cooling Temperatures

Below is a table delineating temperature settings for interior spaces for all district buildings.

	Recommended Heating Level		Recommended Cooling Level	
Type of Space	Occupied	Unoccupied[1]	Occupied[4]	Unoccupied
Classrooms	69 F	60 F[2]	76 F	OFF
Gymnasiums	65 F	58 F[2]	76 F	OFF
Locker Rooms	69 F	58 F	76 F	OFF
Industrial Arts	69 F	60 F	76 F	OFF
Restrooms & Corridors[3]	69 F	60 F	76 F	OFF
Office Areas and Complex	69 F	60 F	76 F	OFF
Unoccupied & Storage Areas	55 F	55 F	OFF	OFF

1—Levels to be maintained to prevent pipes from freezing.

2—Individual zone control can be set for occupied levels for special events.

3—If separately controlled—65 F for occupied heating and 78 F for cooling.

4—Air-Conditioning, during the summer, is only to be utilized in office areas. Any other area use during the summer must be pre-approved by the District Administration.

Rule 2—Heating-Cooling-Ventilation Levels and Recommended Supporting Practices

The opening of windows and exterior doors, other than for entering and exiting a building through designated doors, shall be prohibited for the purpose of reducing building classroom temperatures during the heating season.

When buildings are unoccupied, reduce all outside air intake (fresh air); set dampers to "off" position, or reduce, in general. Fresh air intake to a maximum of 10% air intake level during normally occupied hours (base settings on accepted health standards).

During the heating season, all areas except special areas such as boiler and mechanical rooms, rooms with caustic chemicals, or any other areas of hazardous environment, should not be ventilated when unoccupied.

Prohibit the storing of books, charts, etc., on top of univents, or the placing of equipment in front of air-discharge ducts.

Shut-off exhaust fans during periods of unoccupancy.

Check and set all time clocks for minimum equipment operating times.

Check to be sure that fresh air intake dampers on ventilation fans are closed at night, when building is in the warm-up cycle, and when fans are off.

Locate wall hangings, displays and furniture away from supply and return air grilles and registers to prevent obstructions of air flow.

Allow use of window-mounted air conditioning units *only* when ambiant outside temperatures exceed 85 F or when inside ambient temperatures exceed 75 F. In all other cases, exterior windows can be opened for natural ventilation (in the non-heating season).

Operate air-conditioning units only when absolutely necessary.

Shut-off air handling units in gym (if gym is air conditioned) when physical education classes are outside in warm weather.

Turn off non-critical exhaust fans.

Turn off exhaust fans in kitchen areas when not in use.

Reduce internal heat gain as much as possible during the cooling season by turning out lights and shutting off equipment. (It is recommended that if a room is unoccupied for more than 10 minutes, the lights should be turned off, until in use again).

Seal leaks in ductwork.

Insulate all chilled water lines, refrigerant suction lines and cold air ducts.

Insulate all steam and hot water supply lines, in unoccupied areas.

Encourage students, faculty, and staff to utilize blinds and curtains to help insulate building. Closed blinds and curtains on south and west exposures will help keep a building cool in summer, while opening the blinds and curtains will help warm the bulding when required.

Develop a detailed shutdown program for maximizing energy savings during holidays, semester breaks, and an abbreviated program for over weekends.

Do not hold exterior doors open during passage of occupants entering and leaving the building at start and finish of the day. Limit the number of entrances used during arrival and departure hours. Keep door closures in good repair; remove hold-open devices.

Where feasible, eliminate the use of north and west entries in cold weather, especially in elementary buildings where usage of entries is very high. If north and west entries must be used, provide an exterior wind break to eliminate the wind tunnel effect.

Issue "Letters of Warning" to any personnel who wastes energy or violates the district's energy management/conservation policies and regulations.

Rule 3—Domestic Hot Water Temperatures

	RECOMMENDED TEMPERATURE LEVEL	
USE	OCCUPIED	UNOCCUPIED
General	105 F	OFF
Kitchen	Maintain Health Department Requirements	OFF
Cleaning	105 F	OFF

Restrict water flow from faucets to 0.5 gallons per minute (GPM), and from showers to 2.5 GPM.

(These Prescriptive Standards are recommended by the U.S. Department of Energy.)

General Lighting Rules

Rule 1—Lighting Levels

The following chart represents recommended lighting levels in footcandles. Footcandles should be measured at the task or work level.

ILLUMINATION LEVELS

AREA	RECOMMENDED LEVELS
Auditorium Assembly Stage/Exhibition Social Activities	30–50 FC

Cafeteria	
Quick Service	**30 FC**
Kitchen	**70 FC**
Classrooms	**70–90 FC***
General Use	
Demonstration Area	
Study Halls	
Gymnasium	**20–30 FC**
General Exercises	
Exhibition/Matches	**60 FC****
Assemblies	
Libraries	**70–90 FC**
Reading Areas	
Offices	**70–90 FC**
Services	
Store Rooms	**10 FC**
Toilets/Washrooms	**20 FC**
Corridors/Stairways	**20 FC**
Locker Rooms	**20 FC**
Vocational Education***	
Shops	**40–60 FC**
Drafting	**70–90 FC**
Typing	**70–90 FC**

*75 FC minimum for children with limited vision.
**Special lighting for sports contests only.
***Task lighting should be used for visually difficult work.

Rule 2—Recommended Procedures

Illumination Levels should be periodically reassessed based upon Illuminating Engineering Society of America lighting standards.

Reduce lighting to recommended levels.

Eliminate decorative and display case lighting, where possible.

Reset outside light timers periodically to minimize use.

Use brightly colored light switch stickers to remind people to turn out lights when leaving rooms.

Instruct teachers to use task lighting when possible.

Require custodians to use lights only in rooms being cleaned. Schedule daylight cleaning where possible.

Use multiple switching to allow selection of various light levels.

Label multiple switches to indicate what timers they operate.

Install twist timers on lights in problem areas, such as restrooms, shower areas, lounges and storage areas.

Reduce incandescent light wattage or replace with fluorescent lights.

Replace fluorescent lamps on a regular basis, i.e., after 80% of their lamp life is used.
(Fluorescent lamps use more energy and produce less light during the last 20% of life.)

Disconnect ballasts from fixtures which have the bulbs removed. They use a small amount of energy and will burn up if not disconnected.

Keep light fixtures clean and replace yellowed lenses.

Schedule all athletic practices, band practices, etc. during daytime hours wherever possible. When practices, games, etc. must be conducted after daylight hours, only 50% of lighting in the gymnasium or on the football field can be used during athletic practices. Lights are to be turned on immediately prior to the activity. Any use of the football field lights must have prior approval of the principal.

Reduce exterior protection lighting to areas of high potential damage only. Control exterior lighting through timing devices.

Turn off all lights in areas of a building which are not used for educational purposes; e.g., receiving rooms, boiler rooms, storage closets and equipment rooms.

At the end of every school day, all lights in classroom areas should be turned off where classrooms are not occupied.

At the end of each school day, and the building is no longer utilized for academic or meeting purposes, all corridor lighting should be reduced to the lowest possible levels, without endangering any individuals or cleaning activities. If evening activities are scheduled, then only those lights leading to the area, the actual area utilized, and adjacent public facilities should be lighted to occupied lighting levels. Cleaning personnel shall have lights on only in areas where it is necessary to accomplish cleaning tasks. Upon leaving an area, after cleaning is completed, lights will be turned off and doors locked.

SNOW REMOVAL AND SANDING OPERATIONS

Each school district must make a determination as to whether or not the snow removal/sanding operations necessary to keep the schools open and functioning are within the scope of the district.

Factors such as the availability of equipment, staff, size of the school district and areas to be cleaned/sanded enter into the assessment process. In many instances city/town governments take care of the plowing and sanding of the parking lots and major access roads near and around school grounds leaving to the school district to clean/sand the walkways and minor areas. In other instances, the school district enters into a contractual relationship with one or more contractors who, should the need arise, will be able to clean/sand pre-determined areas by a set time. The price for the operation is generally set in advance, with the contractor being selected through the bid process.

In some instances school districts use their grounds crews to do the plowing and sanding and are able to do the operation on their own. Where the minor snow removal is left to the district staff to do, appropriate size blowers, throwers, etc. are purchased and maintained by district staff.

An individual is designated to monitor the weather reports in order to report to the individual who will make the determination as to whether or not the district will open for the day—on time, or on a delayed-opening schedule. That individual is generally the Director of Buildings and Grounds.

The Director should alert the appropriate crews of the impending bad weather. Custodians need to be alerted to check the boilers for possible malfunction in extremely cold weather. Often, custodians check the boilers during the course of the night to be certain that they are functioning properly. The snow removal crews need to be alerted for the possible early morning call. Telephone chains/trees need to be established so that there can be easy communication between the Director of Building and Grounds and the various crews.

The equipment used for snow removal needs to be checked prior to the onset of the snow season. Sand and ice melting materials need to be ordered and placed at the various locations prior to the onset of the snow season. Once the snow season starts, and the supplies are used, there needs to be an inventory of the available materials, with replenishment made of the used amounts.

Inservice training with the various crews in advance of the season is likewise desired. The priorities for each building need to be established. The reasons for the determination of whether to use sand or ice melting materials is another topic for inservice training.

School district maintenance and custodial staff members need to know what their responsibilities are in the event of a snow storm.

GRASS CUTTING AND FIELD MAINTENANCE

A plan for grass cutting areas has to be identified early in the year so that it is in place by the time that the grass starts growing.

Where there are large areas to be mowed, it may be possible to enter into an arrangement with the city/town government's parks and recreation department in order to have them mow these areas. Large equipment is most desirable, and they generally have that equipment available. Additionally, the parks and recreation departments in most cities/towns use the school grounds and fields for their after-school programs. Where this is not possible, consideration should be given to the purchase of a large piece of equipment, secure a carrier for it and on a schedule, move it from building to building, leaving the areas close to the school buildings for the custodians to mow. There is a need to assign a crew to this large equipment, train them in the care and upkeep of the equipment and keep the schedule so that the grass growth will not get ahead of the mowing operation.

When fields are used from early morning to evening, they don't have much chance to grow. They generally get worn out very quickly. Year after year of heavy use takes its toll on the grounds. It is necessary to take a portion of the field and take it out of use for the better part of a year when they are in "sad" shape. By doing so, it is possible to reseed and fertilize, etc. so that a good turf develops. Many times this needs to be done despite the cries from the community that they need to use the fields.

Schedules need to be maintained for the mowing operation. The application of pesticides should be done carefully and in accordance with the requirements of the district/licensing requirements. See Appendix for pesticide procedures.

In the case of mowing and the application of pesticides, care must be taken to avoid accidental injury to children.

The installation of sprinkler systems, which must be maintained, assist in the maintenance of good turf.

A plan should be developed for the fertilization, aeration, liming, seeding and lining of the fields and grounds early in the year with records maintained for all areas. See Field Condition Report in this section.

COMMUNITY USE OF SCHOOL FACILITIES

Recognizing that the schools belong to the community, Boards of Education, through their policies, generally make the school buildings available to the public.

The school district administration carries out the Board's policies by identifying rules and regulations which carry out the intent of the Board. Independent School District #709, Duluth, Minnesota, has identified a comprehensive set of regulations governing the community's use of school facilities. See sample in this section.

Boards of Education set a fee schedule for the use of certain groups of individuals/organizations wishing to use the facilities. The Schedule of Building/Facility Usage Fees to accompany the above policy, rules and regulations is included in this section, along with a sample Application for Use of a School Facility.

Note that four copies are provided: one for the Community Education Director who needs to know who is using the building; one for the Building Engineer and one for the building Principal who also need to know who is going to be using the building. The fourth copy, when approved is returned to the organization/individual wishing to use the facility.

Community Relations

Use of School Facilities

The School Board, being aware of the large capital investment the community has in school facilities, has determined that the community should receive maximum return for this investment. The introduction of the community education program has been made in pursuit of this objective. The policy is further extended to the use of school buildings and facilities by community groups in the promotion of school, civic, or social goals, at no charge, subject to the following conditions:

1. The requirements of the school program will receive priority in the assignment of school facilities.
2. School-related organizations, such as parent teacher student organizations and professional educational organizations will be given priority over non-related organizations.
3. The community education program will take precedence over non-educational programs.
4. Approved student groups will be given priority over adult groups.
5. Regular building custodial personnel are on duty and performing normal in-session activities.

School equipment may be used by non-school organizations or individuals. Removal of school equipment from buildings to which assigned, to be used for non-school purposes, is not authorized. Requests for equipment to be used shall be made when applying for building permit and noted thereon. A charge will be made for audio visual equipment as listed in the auditorium fee schedule.

School facilities will be available for use on Saturdays, Sundays, or holidays. Any permits issued for buildings which are not staffed with custodial personnel at the time requested will have a usage fee charged for said services. (Exceptions noted in Regulation 1330.4). Closed buildings will not be available for use. (Exception noted in Regulation 1330.4).

Any group utilizing school facilities must maintain proper and sufficient supervision of the group to insure continuance of their permit authorization. The building principal and the community education coordinator, in cooperation with the building engineer, will make final determination of adequacy of supervision.

Policy adopted: 6-9-70
Policy revised: 9-26-72
Policy revised: 7-18-78
Policy revised: 8-10-82

Independent School District #709
Duluth, Minnesota

General Regulations for Community Use of Buildings and Facilities

Application for Permit

1. Request to use buildings and grounds must originate with an application which may be obtained at the facility being requested.
2. Application for use of buildings and grounds must be signed by at least one adult and approved by the building principal and/or his designated building representative. Such application must be in the office of the building Principal one week prior to the date of requested use.
3. All uses of school facilities may be subject to rental fees as determined by the Board of Education and published in a separate fee schedule. Payment should be made to Independent School District No. 709, 226 North 1st Avenue East, Duluth, Minnesota 55802.
4. In an effort to establish a systematic building usage procedure, all requests should include the following:
   A. Dates and hours for requesting meetings.
   B. Type of activity to be conducted.
   C. Estimated attendance.
   D. Specific area of building to be utilized.
   E. Identification of organization requesting building use.
   F. Identification of responsible adults charged with group supervision.
   G. Other related information.

School Activities Conducted After the Close of the Regular School Day

1. The school principal may reserve any part of the building or grounds for school purposes.
2. Permits will be required but no limit to the number of meetings will be set for those activities considered part of the regular school program. The facility or building must be open and the approval of the building Principal must be obtained. An activity leader must be present from the time of entry into the facility until the time of departure of the group.
   A. All uses of buildings or facilities must be scheduled through the building Principal and/or his designated building representative.

B. Principals, or persons designated by the Principal, are permitted to use the building for committee and small group meetings, not to exceed 15 persons, after school hours and Saturdays without permit and without charge. They shall assume full responsibility for the building. The engineer or a member of his staff need not be present. The use of the building will be entered on the Building Use Schedule. For groups larger than 15 persons, the regular permit procedure will apply.

Meeting Place

1. All applications for the use of rooms and/or buildings must be processed through the building Principal, or his designated building representative, for the specific building requested. Printed forms are provided in each building for this purpose.
2. Rules prohibiting the overcrowding of rooms must be strictly adhered to.
3. It will be necessary for all schools to schedule, in advance, the use of their buildings for all school activities so as to eliminate potential scheduling problems with outside agencies/groups desiring building usage.

Regular Meetings and Hours

1. Applications must be made once a year for the use of rooms for regular meetings.
2. Applications for the use of rooms for single meetings must be made at least one week in advance of date desired.
3. The following guidelines will acquaint you with present building assignment regulations:
   A. Regular weekly meetings (i.e. Scouts, Y-teens, etc.)—1½ hours maximum.
   B. Regular monthly meetings (i.e. P.T.A., Community Clubs, Cub Scouts, etc.)—3 hours maximum.

Activities

1. Applications must be made for the use of rooms or buildings for expected activity. If any charge is made to the public, this must be indicated on the application.
2. No charge will be made for regular PTA meetings. One fund-raising meeting per year (such as a carnival) will be allowed for each PTA unit without charge, provided the funds are used for the purchase of equipment or supplies for the school.
3. Use of buildings for their weekly or monthly meetings by the Boy Scouts, Girl Scouts, Gra-Y, Jr. Hi-Y, Teen-Age Clubs, Community Clubs, P.T.A.'s and other community groups, may be permitted where there is no interference with regular school activities.
4. Individuals/groups may not use the building to present programs for which admission is charged, except with School Board approval and payment of a building usage fee.

General Regulations

1. No group or organization may sublet their use of the building or facilities to any other group.
2. A permit may be cancelled if conduct or infraction of rules warrants it.
3. The custodian-engineer on duty will supervise the operation of the physical plant and will not be required to supervise groups or activities.
4. The responsibility and the liability for injury to persons or damage to property must be assumed by the organization or individual making the application.
5. Specific rules for use of special areas such as gymnasiums, swimming pools, kitchen and lunchroom facilities must be adhered to by the users.
6. Buildings must be vacated by 9:30 p.m., unless later use is specified on the building permit. Activities must be concluded in time to provide clearance of the building before the stated time limit.
7. Any group using the facilities or building and charging admission or requesting donations will be subject to a rental fee.
8. Permits for use of school buildings and facilities on Saturdays, Sundays, holidays and vacation periods may be issued upon approval of the building Principal or the designated building representative.
9. Maximum participation and utilization of buildings and facilities will be made. Specific attendance requirements will be determined for special areas such as gymnasiums, swimming pools, lunchrooms and kitchen facilities.
10. Flags other than the United States and the State of Minnesota cannot be displayed at any time on the school buildings or grounds, or within the building except upon special permission granted by the Superintendent of Schools. The United States flag will not be removed from any building, room or facility in which it is presently displayed.
11. The use of golf clubs, golf balls and hard baseballs is limited to designated areas on all school grounds and in school buildings.
12. Permit holders are required to pay for necessary policing and for any damages to bleachers or grounds other than normal wear and tear, as determined by the Board of Education.
13. Use of general school physical education and athletic equipment and supplies will not be permitted. Use of apparatus is permitted only when a qualified instructor is present.
14. All audio-visual equipment must be operated only by those who are certified by the Audio-Visual Education Department of the Board of Education.
15. When school is not in session during school vacation periods, all requests for building usage must be processed at the Office of Director of Physical Plant, Board of Education Building, 226 North First Avenue East, Duluth, Minnesota 55802.
16. Groups originating outside the boundaries of Independent School District 709, Duluth, Minnesota, requesting school facility usage will be charged a usage fee.
17. Card playing, dice, Bingo (or similar games) are prohibited in school buildings.
18. Smoking is not permitted in school buildings, except in areas specifically designated by the building principal and/or building engineer.

19. In conformity with a city ordinance, all decorations used in places of public assembly (classrooms, auditoriums, etc.) must be of fireproof materials or be sprayed with a fireproof solution. Approval for the use of any decorations must be obtained from the building engineer prior to the use of, and installation of said items.
20. Permit holders must be responsible persons at least 21 years of age.
    Recreational leaders and instructors must be responsible individuals with approved qualifications.
    No leader may place a substitute in charge of his group without securing approval from the building Principal or his designated building representative.
21. Attendance will be based upon the nature of the activity and the facilities used, as stated in the permit.
    A. Maximum utilization of school facilities is desired. Small group use of facilities will be discouraged. Permits may be cancelled if attendance falls below a reasonable number of participants.
22. A group will be charged a regular fee when failing to appear unless the building Principal is notified a minimum of three (3) days prior to the scheduled date of activity.
23. Any group holding a blanket permit for use of school facilities that fails to appear to two (2) consecutive periods, will automatically forfeit the remainder of the permit.
24. Alcoholic beverages are not permitted on school premises.

Use of Swimming Pools

1. Maximum number using pool facility at the same time is limited to 50.
2. Any clean swim suit (except wool) may be used. Cut-offs, shirts, blouses and casual wear shorts are not considered swim suits.
3. Participants must bring their own towels.
4. Mixed groups must have both a male and female adult supervisor in attendance.
5. Time allotment in the pool will be limited to a maximum of 1½ hours. Additional time up to ½ hour will be allowed for showering and dressing.
6. Permission for use of any foreign objects in the pool will be granted only when said objects are necessary for training that leads to certification requirements i.e. American Red Cross Life Saving Programs, Special Scuba Diving Instruction Certification Requirements, etc. Approval must be obtained in advance from the Office of the Director of Physical Plant and be so noted on the building permit.
7. Swimming Rules and Regulations stated here-in must be adhered to, and will be made available to each group using pool facilities:
    A. Take a hot soap shower, without suit, before and after swimming.
    B. Use the lavatories before swimming.
    C. Remove bobby pins.
    D. Remove all bandages, plasters, tape, and gum before entering the pool.
    E. Enter and leave the water at the lifeguard's request.
    F. Avoid all forms of dangerous activities on the pool deck or in the water—running, pushing, "ducking" other swimmers, throwing objects, etc.
    G. Remain out of the diving area while the diving board is being used.
    H. Take only one bounce on the board while diving.

I. Wait until others are out of the diving area before beginning a dive.
J. Swim straight out of the diving area after completing a dive.
K. Dive from the board or the side of the pool only when the area is clear.
L. Avoid hanging on the diving board at all times.
M. Stay entirely off the diving board when occupied by another person.

13. The lifeguard or attendant will make foot checks periodically.
14. The lifeguard and attendant will exclude those who have open sores, skin, respiratory, foot, or other infections.
15. The lifeguard and attendant will enforce rules of cleanliness, sanitation, safety and conduct.
16. The lifeguard will allow the use of diving bricks, rings, flutter boards, and swimming fins as part of the regular instruction. Goggles, aqua lungs, skin diving equipment, and snorkels will be used only when qualified instructors are present and preliminary approval has been granted.
17. The lifeguard will see to it that lifesaving equipment is not used for play purposes.
18. The lifeguard will see that the exits are not locked from the inside when pupils are using dressing and shower facilities and/or swimming pool.
19. The lifeguard will see that a telephone or signaling device is available for the lifeguard or instructor to summon help in cases of emergency.
20. The lifeguard will see that a first aid kit is available for necessary preliminary first aid.
21. The lifeguard will prohibit all feats of daring and exhibitions that could jeopardize the personal safety of anyone.
22. The lifeguard will prohibit unnecessary expectoration, spouting of water, rowdiness, etc.
23. The lifeguard will not converse with anyone unless it is necessary for the proper functioning of his duties.

Use of Kitchen and Cafeteria Facilities

1. The Board of Education will grant permission for the use of cafeterias upon payment of the regular rental fee, it being understood that the organizations will pay for any damages and that all machinery and technical equipment will be handled by regular lunchroom employees at the expense of the organization.
2. Use of the lunchroom and kitchen equipment by any group or organization will be granted by the building Principal or the designated building representative.
3. Lunchroom personnel employed by the renting organization will be reimbursed according to the rate of pay as determined by the Board of Education.
4. Banquets or special dinners may be served in the school cafeterias for school related functions. The cost of these services shall be paid by the group using said facilities.
5. All St. Louis County Health Department Rules and Regulations in effect governing food service must be adhered to:
   A. The permit holder must also comply with the following restrictions:
      (1) In no case shall any home-canned products including vegetables, meat, poultry, fish or shellfish, or home-made sausage be sold or served.
      (2) In no case shall any of the following potentially hazardous food be prepared in private homes and brought into school buildings for consumption.

a. Casseroles containing meat, fish or poultry.
b. Baked ham, roasted poultry, roasted pork.
c. Salads and sandwiches containing meat, fish, poultry or eggs.
d. Milk-based cream pies, including banana cream, boston cream, butterscotch, chocolate, coconut cream, cream, or other milk-based mixtures.
e. Custard filled pastries including eclairs and cream puffs or other custard filled baked products.

(3) Dishes and silverware of the cafeteria may be used; however, it shall be the responsibility of the organization under the direction of the cafeteria manager to return, clean and store items in the same manner as before the usage.

Use of Regular School Libraries

1. The school libraries are designed to implement the school curriculum and are not geared to adult public use.
2. Should it become necessary to open school libraries, the following usage procedure is required:
   A. A request for library facility usage must be filed with the building principal and coordinated with the school librarian.
   B. A trained person must be on duty at all times.
   C. Any person charging materials out of the library must be identified by name, address and telephone number so they could be contacted to return the materials.
   D. Any individual, group or organization would have to be responsible for replacing any materials lost, damaged or destroyed during the use of the library facility.

Use of School Grounds and Athletic Fields

1. Grounds may be used for other than school purposes under the rules of the Board of Education. Permits may be granted for political meetings, parade drills, and other similar activities.
2. Application for the use of playgrounds and athletic fields must be made in the same manner as for the use of buildings and facilities.
3. The applicant will provide police and/or fire supervision for those activities where it is deemed necessary by the Board of Education.
4. There will be no charge for the use of elementary and secondary school grounds.
5. Rental charges for the use of Public Schools Stadium will be determined by the Board of Education.
6. Professional contests will not be played on Duluth Public School athletic fields or playgrounds.

Use of Gymnasiums

Gymnasiums may be used by organizations for recreation and instruction purposes.

1. No instructor, member of a gymnasium class or athletic group, or visitor will be on the playing portion of the floor wearing street shoes.
2. Every leader is requested to use every reasonable caution to see that snow, water, or dirt are removed from shoes before admittance to the gymnasium.

3. Every leader will be held responsible for enforcement of all safety regulations.
4. Every leader is required to conduct only those gymnasium activities that are meaningful and within the physical capabilities of those students/adults expected to perform same.
5. Use of school district owned physical education and athletic equipment and supplies will not be permitted unless specifically authorized by the building principal or his designated representative.
6. Use of physical education apparatus is permitted only when a leader competent to instruct in its use is present and has the approval of the building Principal or his designated building representative.

Use of Industrial Arts Facilities

1. The administrative manual for Minnesota Public Schools, Edu 67 - 3, 10a. prescribes the responsibility for equipment as that of the Industrial Arts teacher.
   A. The programs held in Industrial Arts facilities must be approved by the Director of Adult Education and Community Schools and this department will also approve the use of said facility.

BID SPECIFICATIONS

The Director of Buildings and Grounds is often called upon to draft bid specifications for the various areas that fall within the job description.

Following are the specifications for the installation of thermostatic valves in the School District of University City. The Appendix contains specifications for new burners, water heater and related work for the Summit Board of Education, and specifications for blacktopping of a driveway in the Independent School District #709.

The format and requirements vary from district to district and from state to state. While the bid specs may be used, it is important to adapt them to the requirements of the particular school district.

Specifications for Installing Thermostatic Valves

Bids

Sealed bids will be returned to the Finance Office, Board of Education, 725 Kingsland Avenue, University City, Missouri 63130, no later than 2:00 p.m. Monday, June 2, 1980 for all labor, materials and equipment necessary to install Thermostatic Valves at several locations in accordance with these specifications. Bids are to be enclosed in an opaque, sealed envelope and are to be plainly marked "BID: VALVES." The Board of Education reserves the right to reject any or all bids and to waive technicalities.

Instructions to Bidders

Each contractor bidding on this work shall view the sites and shall carefully read these specifications and submit his proposal subject to all the conditions contained therein. The fact that a contractor submits a bid will be construed by the Board to mean that he bids and agrees to carry out all the provisions set forth or implied in these specifications.

Contract and Bond

The contractor shall execute, pay for and deliver to the Owner a Performance of Contract Bond and a Labor and Material Payment Bond. The owner requests that the successful contractors procure their Performance and Labor and Material Payment Bonds from an approved surety company, authorized to do business in the State of Missouri as surety thereon. Said bonds are to be made payable to the Owner in an amount equal to one hundred percent (100%) of the contract price.

Bid Deposit

Each bidder must submit with his bid, a cashier's or treasurer's check or a guaranty bond with a surety company as surety, in an amount equal to five percent (5%) of the sum of his bid.

Insurance

A Certificate of Employer's Liability Insurance will be filed with the Board.

Contractor's Liability Insurance

The contractor shall maintain such insurance as will protect him from claims under Workmen's Compensation Acts and other employee benefits from claims for damages because of bodily injury, including death and from claims for damages to property which may arise both out of and during operations under this contract, whether such operations be by himself or by any sub-contractor or anyone directly or indirectly employed by either of them. This insurance shall be written for not less than any limits of liability specified as part of this contract. Certificates of such insurance shall be filed with the Owner.

Protection and Safety

The contractor shall furnish all materials necessary for the protection of buildings that might be damaged while work is performed. Defective or damaged work or any material damaged before final acceptance shall be satisfactorily replaced at the expense of the contractor.

The safety of the children shall be the responsibility of the contractor while working on the buildings; also, no speeding or careless driving will be allowed. The use of profane language is prohibited on school property.

Workmen are *not allowed* to park personal cars on school property.

Workmanship

All workmanship shall be of the highest quality. All work shall be performed to the satisfaction of the Board and/or the Bonding Company and shall be guaranteed for a minimum of two years.

Time of Completion

The contractor shall include in his or her bid the estimated number of calendar days required to complete the work. At the time of awarding the contract, a completion date will be established from this estimate.

Progress Schedule

It is imperative that the work be processed in such a manner as to complete the project within the time specified. The contractor shall, within five (5) days after the awarding of the contract, submit for the Owner's approval, a progress schedule of the work, indicating the expected start and completion date for each branch of the work.

Patching

The Contractor shall repair any damage to the building, due to the operations under his contract.

Quality, Materials and Workmanship

All work described in these specifications and all work necessary to completely finish the work so described is to be executed in a thoroughly substantial and workmanlike manner.

Guarantee or Warranty must be submitted with bid.

Companies and/or individuals bidding on these specifications must operate in compliance with that part of the Federal Government's requirement for equal employment opportunities practices, which reads as follows:

"The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, or national origin. He will take affirmative action to insure that applicants are employed, and that employees are treated during employment without regards to their race, creed, color, sex, or national origin. Such action shall include, but shall not be limited to the following: employment, grading, demotion, or transfers; recruitment or recruitment advertisement; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship."

By virtue of statutory authority, a preference will be given to materials product supplies, provisions and all other articles produced, manufactured, made or grown within the State of Missouri. (R.S. 1939, Section 14617).

Courtesy: School District of University City, MO

Form of Proposal

Ladies and Gentlemen:

We, or I, propose to furnish all labor, materials and equipment; including debris removal, necessary to perform and do all work in accordance with the specifications dated _____, as attached hereto, at all locations

For the total sum of $ _____

We certify that this company is in compliance with that part of the Federal Government's requirement as stated in specifications.

Signed this _____ day of _____ 1980

_____

COMPANY NAME

_____

ADDRESS PHONE

_____

SIGNATURE AND TITLE OF BIDDER

Requirements:

Supply one-hundred (100) #VT 105 combination ¼" Valves plus all in one unit (T111) as manufactured by Braukmann Controls Corporation; bid price should include installation of Valves in various schools.

The Senior High School will be the first school to be supplied.

All Valves are to be pre-set to 68° Fahrenheit before installation.

Each prospective bidder should visit the sites in order to properly estimate the installation time necessary to quote.

Appendix 1

Employee Peformance Rating

Instructions

1. Complete the hourly employee performance rating form in *duplicate*. Retain the original copy in the employee's field personnel file. Forward the duplicate copy to Service Systems Corporation Headquarters, Attention: Personnel Records.
2. Each supervisor will complete an hourly employee performance rating for all hourly employees under the supervisor's jurisdiction (a) at least once annually or (b) when the supervisor or the employee is changing positions and/or locations and the supervisor will no longer have supervisory responsibility for the employee, provided a rating has not been completed within the previous three month period, (c) between 90–180 days after the new employee has been hired (orientation review) (d) when the employee is scheduled for a merit wage increase (e) when the employee is scheduled for a promotion or reclassification.
3. Complete the identification and informational data as required.
4. Item 1. Identify, list or state the specific accomplishments, if any, of the employee.
5. Item 2. Identify, list or state areas of improvement which the employee needs to attend to, if any, in order to perform at a higher level of excellence.
6. Item 3. Indicate, by placing a checkmark (✓) in the proper performance description column your evaluation of the employee's performance for each of the rating factors listed. Definitions of the rating factors are stated in the Human Resources Manual.
7. Item 4. Identify and state any circumstances, conditions or factors which should be mentioned as having a bearing on the employee's performance which were not identified or explained above.
8. Item 5. *Performance*—Place a checkmark (✓) on the line which most accurately reflects the performance of the employee this reporting period. If the summary appraisal is not basically consistent with the rating factors an explanation must appear in Item 4.

   Development—Place a checkmark (✓) in the box which most accurately reflects the developmental status of the employee as of the date of the rating.

   Training—List area(s) of training, if any, the employee should receive to increase employee's level of performance.
9. The rating supervisor will sign and date the hourly employee performance rating. If the rating official chooses to use this rating form as the basis for a discussion with the employee, of the employee's performance, the rating official *may* present the completed form to the employee for the employee's review. If the performance rating is reviewed by the employee, the employee *may* sign the performance rating as an acknowledgment of review by the employee. The rating official has the option to show the completed performance rating to the

employee, or not, the employee has the option to acknowledge review of the performance rating by signing and dating the form. Irrespective of whether or not the employee if presented and/or acknowledges the performance rating, the rating official will forward the rating form to the next supervisory level for review by the rating official's supervisor. The reviewing supervisor will indicate concurrence or non-concurrence with the rating, and sign and date the form. If the reviewing supervisor does not concur with the rating, he should attach two copies of a memo of explanation to this form. Distribution of this completed form, and any attachments will be in accordance with Instruction 1, above.

EMPLOYEE PERFORMANCE RATING

HOURLY EMPLOYEE PERFORMANCE RATING

EMPLOYEE'S NAME (PRINT)		POSITION TITLE		SOCIAL SECURITY NO.		DATE
						/ /
DIVISION	LOCATION	CITY	STATE		DIV.	PAYROLL UNIT NO.

REASON FOR RATING		DATE LAST RATED
☐ PERIODIC REVIEW ☐ ORIENTATION REVIEW ☐ PROMOTION/RECLASSIFY ☐ MERIT ☐ SUPERVISORY CHANGE	HOW LONG HAS EMPLOYEE WORKED IN THIS UNIT? _____ HOW LONG HAS EMPLOYEE WORKED IN THIS POSITION? _____ HOW LONG HAS EMPLOYEE WORKED UNDER YOUR SUPERVISION? _____ DID EMPLOYEE RECEIVE TRAINING DURING THIS REPORT PERIOD? ☐ YES ☐ NO HAS PERFORMANCE BEEN DISCUSSED WITH EMPLOYEE? ☐ YES ☐ NO	

1. WHAT SPECIFIC ACCOMPLISHMENTS AND ACHIEVEMENTS HAS THE EMPLOYEE CONTRIBUTED THIS REPORTING PERIOD?

2. IN WHAT AREAS AND/OR IN WHAT WAYS DOES THE EMPLOYEE NEED TO ENHANCE PERFORMANCE?

3. PERFORMANCE RATING FACTORS (✓)

RATING ▶	INADEQUATE	MARGINAL	BELOW AVERAGE	AVERAGE	ABOVE AVERAGE	EXCEPTIONAL	OUTSTANDING
A. WORK QUALITY	A	A	A	A	A	A	A
B. WORK QUANTITY	B	B	B	B	B	B	B
C. SAFETY CONSCIOUSNESS	C	C	C	C	C	C	C
D. APPEARANCE	D	D	D	D	D	D	D
E. ATTENDANCE	E	E	E	E	E	E	E
F. PUNCTUALITY	F	F	F	F	F	F	F
G. DEPENDABILITY	G	G	G	G	G	G	G
H. COMMUNICATIONS ABILITY	H	H	H	H	H	H	H
I. JUDGMENT	I	I	I	I	I	I	I
J. LOYALTY	J	J	J	J	J	J	J
K. INITIATIVE	K	K	K	K	K	K	K
L. ATTITUDE	L	L	L	L	L	L	L

4. STATE ANY OTHER FACTORS, CIRCUMSTANCES, OR CONDITIONS NOT INDICATED ABOVE, WHICH HAS AN INFLUENCE ON THE EMPLOYEE'S PERFORMANCE RATING FOR THIS REPORTING PERIOD.

5. SUMMARY

PERFORMANCE	(✓)	DEVELOPMENT	(✓)	TRAINING
INADEQUATE		NEEDS ASSISTANCE IN PRESENT POSITION		THE EMPLOYEE SHOULD RECEIVE ADDITIONAL TRAINING IN:
MARGINAL		SHOULD CONTINUE IN PRESENT POSITION		
BELOW AVERAGE		CAPABLE OF ASSUMING SOME ADDITIONAL DUTIES		
AVERAGE		READY FOR ADDITIONAL RESPONSIBILITY		
ABOVE AVERAGE		POSSESSES MANAGERIAL POTENTIAL		
EXCEPTIONAL				
OUTSTANDING				

RATER'S SIGNATURE	DATE	EMPLOYEE'S SIGNATURE (OPTIONAL)	DATE
SUPERVISOR'S SIGNATURE/TITLE		☐ CONCUR ☐ NOT CONCUR	DATE

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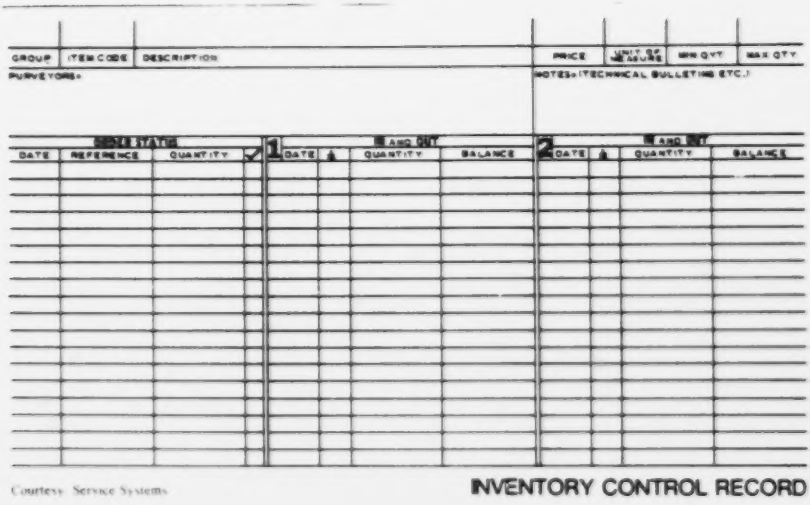
Appendix 2

Inventory Control

It is necessary to establish a basic inventory of items needed to perform recurring repairs/maintenance. Once the basic inventory is established, it is important to identify the level at which reordering will take place. Purchase orders should be entered along with the order status on an inventory card for each item. As the item is received into stock, or taken from stock, it should be noted on the inventory card. The balance in the inventory should be identified after each transaction.

Inventory Control Record



Courtesy: Service Systems

INVENTORY CONTROL RECORD

ASSIGNED TO _____ DATE _____ PRIORITY NO. _____ TYPE OF WORK _____

OPERATIONS & MAINTENANCE WORK REQUEST

School Code No. _____

Ordered by _____ Date _____
EMPLOYEE'S SIGNATURE

Approved by _____ _____
PRINCIPAL'S SIGNATURE DIRECTOR OPERATIONS SIGNATURE

QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
		(For Maintenance Department use only) List Materials Needed to Complete Job.		

List work to be accomplished below this line.

SCHOOL	DATE COMPLETED	SIGNATURE

OPERATIONS OFFICE (white copy)

BUILDING PRINCIPAL - COMPLETED W.O. COPY (blue copy)

MAINTENANCE WORK COPY (yellow copy)

BUILDING PRINCIPAL - W.O. ISSUING COPY (pink copy)

REQUISITION
FOR
ALTERATIONS AND REPAIRS

Date

No.

School _____

Description

_____

_____

_____

_____

_____

_____

Reason for request

_____

_____

SOURCE OF FUNDS

School ..... Code _____

Federal ..... Code _____

Other ..... Code _____

Request submitted by _____

Approved _____
SUPERVISOR

COST DATA

MATERIAL REQUIRED:	QUANTITY	UNIT COST	TOTAL COST

LABOR REQUIRED:	HOURS	RATE	TOTAL COST

GRAND TOTAL _____

	SHOP	DATE COMPLETED	SIGNED
	Carpenter		
	Electrical		
	Garage		
	Mechanical		

	Safety —
	Complete at once
	Inspect — Report back
	Request a cost estimate before compliance
	Code Needed — Should come from Bld. fund

Work Authorized _____

Date _____

Work Order No. _____

White Copy - Physical Plant
Gold Copy - Foreman
Blue Copy - Foreman
Pink Copy - Applicants

185.

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MAINTENANCE DEPARTMENT
(Equipment · Repairs · Supplies)

School: _____ Date: _____

Location of Job: _____

Nature of Job: _____

_____

_____

Materials Needed: _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Requested by: _____
(signature)

Job Completed and/or
Materials Supplied: _____
(signature and date)

COST: Labor _____

Material _____

TOTAL _____

School custodian fills out form, retains pink copy, sends white and canary copies to maintenance supervisor's office. When job has been completed, the supervisor returns the canary copy to the school and retains the white copy in the maintenance file.

Appendix 3

Pesticide Procedures

To Be Used Only Under Direct Supervision of *Properly Licensed Pesticide Operator*

Storing Pesticides

—Always store pesticides in a locked room which has a warning sign to the outside door.
—Keep pesticides in their original labelled container.
—Never store pesticides in old bottles or food containers where they could be mistaken for food or drink for humans or animals.
—Never store pesticides near food, feed or seed.
—Store pesticides in tightly sealed containers.
—Store them where they are protected from freezing or excessive heat.
—Storage area should be well ventilated to remove toxic fumes.
—Some pesticides should not be stored together. Hormonal herbicides should not be stored with insecticides or fungicides.

Mixing or Loading Pesticides

—Handling pesticides: put on the correct protective clothing and other necessary protective equipment. Read the label for instructions.
—Mix the pesticide outdoors where there is good light and ventilation.
—Stand upwind of the pesticide to avoid contaminating yourself.
—Use a sharp knife to open paper bags, do not tear them.
—Use only the amount specified on the label.
—Keep the container below eye level to avoid splashing or spilling any pesticide into your face and eyes.
—If you splash or spill a pesticide while mixing or loading STOP immediately. Remove contaminated clothing, and wash thoroughly with detergent and water.

Guidelines When Applying Pesticides

—Read the label. Do not trust your memory.
—Check the application equipment. Look for leaking, plugged or worn nozzles and examine the seals on the filter openings.
—Mix the pesticide at the recommended rate and apply at the specific dosage.
—Before pesticide application, clear all livestock, pets, people and susceptible plants from the area to be treated.
—Apply pesticide under acceptable weather conditions (i.e. winds less than 8 km. per hour) and temperatures should be less than 30 C.
—Do not work alone.
—Prevent the pesticide from contaminating streams, ponds, lakes or other bodies of water.
—Do not contaminate food or feed through careless application method.

Pesticide Disposal

—Waste pesticide should be considered hazardous to the public and to people handling them. The materials are also potential pollutants of water, air and land.

—Consult pesticide manufacturers or the pesticide control branch for special instructions. Some pesticide manufacturers may accept small amounts of waste pesticides for disposal at the factory.

Disposal of Pesticide Containers

Glass and Plastic Containers

Rinse out glass and plastic containers three times with water during the mixing process, punch holes and dispose in your garbage container.

Paper Containers

Make certain that containers or bags are completely empty before disposing them in your garbage container. Empty containers may also be burned in an isolated location away from water supply. Do not burn herbicide containers which contained 2, 4-D. These herbicides volatilize, the resulting vapour may damage nearby plants, crops, etc.

Metal Containers

Rinse out metal containers three times with water during the mixing process and dispose of them in your garbage container. Small containers must be flattened or well punctured. Container should be thoroughly washed out with a water-caustic detergent-soda. Bury the rinse solution at least 50 cm. deep in isolated area. Puncture or crush container before disposal.

Courtesy: School District #37, Delta, B.C.

Appendix 4

APPLICATION FOR USE OF A SCHOOL FACILITY

Submit all copies of application to principal / community education coordinator of requested facility. A copy will be returned to petitioner after processing. Separate requests must be submitted for each facility. Multiple use of a given facility may be requested at one time. Applications must be submitted at least two days prior to use of facility and five days if overtime is required.

Date _____

_____

Facility Requested **Date / Dates Requested**

_____

Organization Making Request **Address of Organization** **Telephone No.**

_____

Purpose of Facility Use **Hours Facility to be Used**

Area to be Used: Gym _____ Auditorium _____ Pool _____ Cafeteria _____

Classroom No. _____ Other (please specify) _____

Equipment Requested: Tables _____ Chairs _____ Microphone _____ Organ _____

Auditorium Sound / Light System _____ Spotlight _____

Other (please specify) _____

Will admission be charged or a donation requested? Yes _____ No _____

Anticipated Attendance _____

I accept responsibility for building usage fee, supervision, damage and compliance with Title IX requirements.

_____

Signature of Person Making Request Telephone No.

Fee for use of Facility $ _____ or Costs Charged to Code _____

Auditorium _____

Pool _____ Fee for use of Special Equipment $ _____

Gymnasium _____

Total $ _____

Approved _____ Disapproved _____ _____

Community Education Coordinator

Approved _____ Disapproved _____ _____

Principal

Comments: _____

_____

White copy: Community Education Director
Blue copy: Building Engineer
Green copy: Organization / Individual
Pink copy: Building Principal

110.

SCHEDULE OF BUILDING/FACILITY USAGE FEES

Schedule of rental rates for use of school facilities, other than auditoriums, during the hours that the buildings are NOT staffed by regular custodial forces.

SWIMMING POOLS AND LOCKER ROOMS:

MONDAY THROUGH SATURDAY		SUNDAY AND HOLIDAYS	
Permit Time	Rate	Permit Time	Rate
1½ hours	$ 87.00	1½ hours	$106.00
2 hours	97.00	2 hours	118.00
$9.25 for each additional ½ hour of permit time.		$11.25 for each additional ½ hour of permit time.	

SWIMMING POOL, GYM AND LOCKER ROOMS:

Permit Time	Rate	Permit Time	Rate
1½ hours	$ 97.00	1½ hours	$118.00
2 hours	106.00	2 hours	135.00
$9.25 for each additional ½ hour of permit time.		$11.25 for each additional ½ hour of permit time.	

The above rates do not include lifeguard or supervisors. These are to be provided by groups using the facilities.

The above rates allow four hours time after use for cleaning and sanitizing pool decks, gym and locker rooms.

GYMS, CAFETERIAS, CLASSROOMS, ETC.:

MONDAY THROUGH SATURDAY		SUNDAY AND HOLIDAYS	
Permit Time	Rate	Permit Time	Rate
1½ hours	$ 37.00	1½ hours	$ 45.00
2 hours	46.25	2 hours	56.25
$9.25 for each additional ½ hour of permit time.		$11.25 for each additional ½ hour of permit time.	

These rates allow 15 minutes before and after use for opening and securing buildings. Any activities needing more than this for preparation or clean-up should be charged accordingly.

Allow one hour for each locker room used in connection with gyms.

These charges should be reviewed annually to reflect salary increases granted by the School Board.

In addition to the cafeteria facility usage fee, the use of kitchen equipment requires the presence of food service personnel. Said personnel must be compensated by the group requesting the facility. Rate of pay is the present salary schedule in effect.

RENTAL RATES OF AUDITORIUMS

		*COMMERCIAL		NON-COMMERCIAL	
AUDITORIUM	CAPACITY	MON-SAT/HOLIDAYS	SUNDAYS	MON-SAT/HOLIDAYS	SUNDAYS
Denfeld	1852	$410.00	$495.00	$235.00	$285.00
Washington	1171	350.00	420.00	210.00	260.00
Ordean	894	290.00	360.00	170.00	215.00
Woodland	892	290.00	360.00	170.00	215.00
Central	602	260.00	330.00	150.00	170.00
East	571	260.00	330.00	150.00	170.00
Lincoln	734	260.00	330.00	150.00	170.00
Morgan Park	720	260.00	330.00	150.00	170.00
MacArthur-West	635	260.00	330.00	150.00	170.00

*Any non-school group charging admission fees or requesting donations will be classified as commercial users.

These rates are based on a four hour minimum rate. Add $47.00 commercial, $37.00 non-commercial per hour for permit time over four hours. Stage rehearsal and preparation time to be charged at the rate of $28.50 commercial, $18.50 non-commercial per hour on Monday through Saturdays and $32.50 commercial, $22.50 non-commercial per hour on Sundays and Holidays.

A special fee for use of audio visual equipment will be charged for non-school use. Such fees shall be paid directly to the school.

Microphones	$15.00 each
Portable P.A. System	$25.00
Spot Lights	$25.00
Organ	$40.00

Courtesy: ISD #709, Duluth, MN.

Appendix 5

Inspection Logs and Report Forms

There is a need for management to know what is going on and whether or not the program that has been set into place is in fact being accomplished. One way to accomplish this oversight is by means of logs or report forms which, when completed and turned in, give the supervisor a fair indication of what has been accomplished, what needs to be done, etc.

Following are forms that have been used by the University School District and by School District #37, Delta, B.C. Again, the designations "F-8," "A-8" refer back to the codes used in the Preventive Maintenance Guides.

The forms included are:

—Fire Equipment Inspection Log
—Alarm Inspection Log
—Grass Mowing and Trimming Schedule
—Field Condition Report
—Monthly Playground Equipment Inspection Report
—Vehicle Daily Report
—Boiler Maintenance and Operating Log
—Fire Safety Maintenance Log

FIRE EQUIPMENT INSPECTION LOG

Year _____

Item #	Location	Unit	Initials & Note	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

F—8 F—9 F—10 — ANNUALLY
VISUAL INSPECTION — MONTHLY
F—4 F—5 — QUARTERLY

ALARM INSPECTION LOG

Year _____

Item #	Location	Unit	Initials & Note	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

VISUAL INSPECTION — Monthly
A—8 — Quarterly

Date: _____

(SOUTH) FIELD CONDITION REPORT

	Condition										W.O.												Others	Remarks
	Chuck Holes		Standing Water		Muddy		Dusty		Faulty Sprinkler		W.O. Req'd		W.O.		Excellent		Good No.AG		Poor No.P		T.Un. P.		O. For Season			
School	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W	Gr.	A/W		
Beach Grove																								
Boundary Bay																								
Boundary Beach																								
Delta Manor																								
Delta Secondary																								
English Bluff																								
Hawthorne																								
Holly																								
Ladner																								
Pebble Hill																								
Port Guichon																								
South Delta Sec																								
South Park																								
Tsawwassen Jr.																								
Weaver																								

Gr—Grassfield
A/W—All Weather Field
W/O—Work Order
AG—Additional Games
P—Practice
T.un.P.—Temporarily Unplayable
O—Out

Prepared by: _____

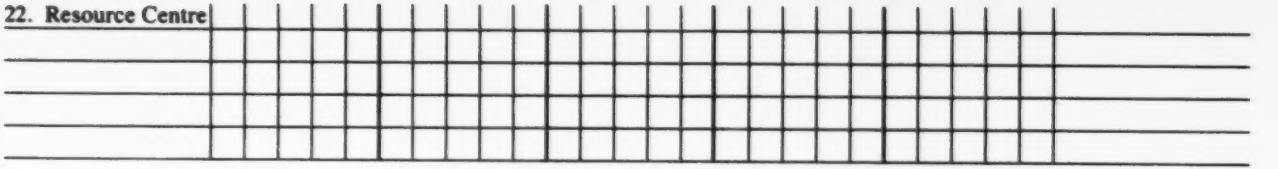
Courtesy: S.D.#37, Delta, B.C.

GRASS MOWING AND TRIMMING SCHEDULE

Date: _____

	M	T	W	T	F	M	T	W	T	F	M	T	W	T	F	M	T	W	T	F	M	T	W	T	F	REMARKS
1. North Delta																										
2. Richardson																										
3. Hellings																										
4. Kennedy																										
5. Gibson																										
6. Delview																										
7. Annieville																										
8. Devon Gardens																										
9. Brooke																										
10. Sunbury																										
11. Sands																										
12. Gray																										
13. McCloskey																										
14. Jarvis																										
15. Chalmers																										
16. Burnsview																										
17. Heath																										
18. Pinewood																										
19. Cougr Canyon																										
20. Seaquam																										
21. Sunshine Hills																										

22. **Resource Centre**



Prepared by: _____

Courtesy: S.D.#37, Delta, B.C.

(NORTH) MONTHLY PLAYGROUND EQUIPMENT INSPECTION REPORT—TO BE TURNED IN ON COMPLETION

DATE—MONTH—YEAR _____

SCHOOL	BURMA BRIDGES	SWINGS	TEETER TOTTER	SLIDES	GYM CLIMBERS	ARCH CLIMBERS	LADDER CLIMBERS	MOUNTAIN CLIMBERS	DOME CLIMBERS	TIRE CLIMBERS	MONKEY BARS	TIRE SWING	BALANCE BEAM	MERRY GO AROUND	ROCKING HORSE	BASKETBALL	SOCCER GOALS	NUMBER OF HOURS	COMMENTS
PINEWOOD																			
COUGAR CANYON																			
SUNSHINE HILLS																			
HEATH																			
CHALMERS																			
JARVIS																			
MCCLOSKEY																			
GRAY																			
BROOKE																			
DEVON GARDENS																			
ANNIEVILLE																			
GIBSON																			
KENNEDY																			
HELLINGS																			
RICHARDSON																			

	EQUIPMENT CHECKED AND OK
X	OUT OF COMMISSION FOR REPAIRS
O	REPLACE AS SOON AS POSSIBLE
P	NEEDS PAINTING
S	NEEDS SAND AND LEVELLING

Prepared by: _____

Courtesy: S.D. #37, Delta, B.C.

BOILER MAINTENANCE AND OPERATING LOG

Name of Building _____ Boiler No. _____ Year _____

OPERATING LOG (Weekly tests are to be recorded in spaces provided below by inserting date and initial)

	GAUGE COCKS WATER GLASSES					LOW WATER CUT-OFF FEEDWATER REGULATOR					FEEDWATER PUMP RETURN SYSTEM					SAFETY VALVES RELIEF VALVES					BURNERS FUEL SYSTEM					LUBRICATION OF AUXILIARIES				
WEEK	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
JAN.																														
FEB.																														
MAR.																														
APR.																														
MAY																														
JUNE																														
JULY																														
AUG.																														
SEPT.																														
OCT.																														
NOV.																														
DEC.																														

MAINTENANCE LOG (At least annually, or as often as conditions indicate, the following services should be performed)

CLEAN FIRE SURFACES																														
CLEAN WATER SURFACES																														
OVERHAUL LOW-WATER CUT-OFF																														
OVERHAUL FEEDWATER REGULATOR																														
TEST SAFETY VALVE																														
CHECK FIRING EQUIPMENT																														
CHECK INSTRUMENTS																														
INSPECTIONS																														

(Use above spaces to record service dates)

Courtesy: Kemper Insurance Companies

VEHICLE DAILY REPORT

MONTH DATE	VEH. NO.	MILEAGE OR HOURS	CHECK GAS	CHECK OIL	CHECK WATER	CHECK BATTERY	DATE OF SERVICE	VEHICLE REPAIRS	DRIVER'S SIGNATURE
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
TOTAL									

Courtesy: S.D.#37, Delta, B.C.

FIRE SAFETY MAINTENANCE LOG

TO BE KEPT IN MANAGER'S POSSESSION, AVAILABLE FOR FIRE DEPARTMENT INSPECTION.

Building Address: _____

Name: _____

FIRE ALARM SYSTEM			SPRINKLER & STANDPIPES			EMERGENCY LIGHTING		
DATE	INIT	REMARKS	DATE	INIT	REMARKS	DATE	INIT	REMARKS

District #37, Delta, B.C.

Appendix 6

SPECIFICATIONS

for

NEW BURNERS, WATER HEATER AND RELATED WORK

for the

JEFFERSON SCHOOL

Summit, New Jersey

for the

SUMMIT BOARD OF EDUCATION
14 Beekman Terrace
Summit, New Jersey 07901

1986

Prepared by:

JEFFREY & KALLAUR
Consulting Engineers
2171 Morris Avenue
Union, N.J. 07083

Project No. 86023

NOTE: The legal and insurance forms, etc., which always accompany our specifications have been omitted from this copy.

Technical Specifications

Scope of Work

The Contractor shall furnish all labor, materials, related items, tools, sub-contract work, and all else necessary to complete the installation and leave them ready for operation by the Owner, in a safe and first-class working condition.

The work shall include but not be limited to the following:

Remove oil burners and replace with new combination gas/oil burners, fuel oil pumps, piping and new controls.

Install a gas fired water heater and flue. Cross connect new piping with existing domestic hot water system piping.

Install new piping insulation.

Install new gas piping from new meter location. Provide meter pad and chain link fencing.

Pipe & Fittings

Water piping shall be Type "L" hard drawn copper with wrought copper, cast brass or bronze fittings, of weights corresponding to piping.

Gas and oil piping shall be ASTM 120 standard weight, black steel with malleable iron screwed fittings for sizes 2" and smaller; and with 125 lb. steel welding pattern fittings for sizes 2½" and larger; flanges, where required shall be forged steel, 150 lb. WSP.

Sprinkler piping shall be black steel, cut grooved with victaulic ductile iron fittings and style 77 couplings or Type L copper with cast brass or bronze fittings (Contractor's option) for sprinkler system.

Joints

For screwed pipe: shall be with teflon tape or with the best quality pipe joint compound carefully placed on the thread of the pipes and not on the fittings. Use graphite on all cleanout plugs.

For copper pipe: shall be soldered by means of suitable flux and 95% tin–5% antimony solder—no *lead* solder.

Flange fittings and unions shall be made up with composition ring gaskets, 1/16" thick, accurately cut to fit flange diameters and bolt circles. Between copper tubing and threaded pipe, shall be IPS adaptor fittings soldered to copper tubing and screwed to threaded pipe for fittings. Between ferrous and nonferrous piping, install V-line steel couplings, lined with phenolic impregnated plastic, as manufactured by WALTER VALLET CO., Detroit, Michigan, or dielectric fittings, as manufactured by EPCO, or ELECTRIC PIPE LINE, INC.

Welding shall be electric arc or gas welded by Oxy-Acetylene process, using high test welding rod.

1. Line welds shall be of single V-butt type. All defective joints shall be cut out and rewelded, using new insertions. Caulking or peening of defective joints will be permitted.
2. All welding shall be done in accordance with the welding procedures of the National Certified Pipe Welding Bureau, or any other approved procedure, conforming to the requirements of the ASME Boiler and Pressure Vessel Code, or the ASA Code for Pressure Piping. No welder shall be employed on the work who has not been fully qualified by a member of a local chapter of the National Certified Pipe Welding Bureau or similar locally recognized testing authority.

Testing

The new water piping and gas piping shall be tested prior to final connection to existing systems or new equipment. The Contractor shall, at his own expense, during the progress of the work or upon completion, make such tests as are herein specified or required by the Engineers. This shall include all required apparatus, materials and labor and any temporary connections required for making tests.

All new water piping shall be tested to a hydrostatic pressure of 150 psi which pressure shall be maintained without pumping for a period of one hour.

Gas piping shall be tested with air at a pressure of 10 psi which pressure shall be maintained without pumping for a period of one hour.

Sprinkler piping shall be tested hydrostatically at not less than .200 psi without a loss of pressure for a period of two hours.

Any leaks, defects or deficiencies discovered as a result of the tests shall be immediately repaired or made good. The test shall be repeated to verify that the leaks have been repaired.

The Contractor shall test and adjust all apparatus, specialties, etc., furnished and installed under this contract and see that they operate properly and are free from defects. He shall also test all motors and leave same in proper and satisfactory working condition.

Hangers

Provide pipe hangers as follows:

Piping 2" diameter and less—Adjustable steel clevis type hangers.

Piping 2½" and larger—Malleable iron adjustable type with adjustable swivel pipe rings and saddles.

Hanger rods shall be steel threaded, furnished with nuts and lock nuts, sized in accordance with the following schedule:

Pipe Size	Rod Size
¾" to 2"	⅜"
2½" to 3"	½"
3" and larger	⅝"

Size all hangers so that insulation is continuous through same.

Valves

Furnish and install ball and check valves by HAMMOND or approved equal.

Ball valves shall be bronze bodied, bronze trimmed with TFE reinforced seats and 0-ring flange seals and carbon-steel handles with vinyl grip. Thread or solder ends as required. BV-811-T or BV-812T.

Check valves shall be bronze bodied horizontal swing check type with renewable bronze discs 1B940 or 1B941.

Gas Cocks

Furnish and install gas cocks as manufactured by WALWORTH or approved equal.

Gas cock in piping to unit heater shall be a bronze bodied, square head cock complete with wrench. Fig. 555.

Gas cocks in piping to burners shall be lubricated plug type, cast iron bodied, short pattern and wrench operated.

Provide lubricant and plug valve wrenches.

Unions

Furnish and install unions in all piping connections to equipment. All equipment shall be installed so that it may be readily disconnected and removed whenever necessary without cutting connecting piping.

For Steel Piping—Use 150 lb. malleable iron unions with brass-to-iron seats USAS B-16.3.

For Copper Piping—Use 150 lb. brass ground joint type.

Gas/Oil Burner Replacements

The Contractor shall provide all labor and material as required to remove the existing rotary cup fuel oil burners and controllers from the existing boilers and furnish and install a new natural gas/No. 4 fuel oil burner on each boiler. The installation includes burner mounting, burner power and control wiring, new boiler controls, refractory modifications, fuel oil piping at the burners, and gas piping.

The Contractor shall thoroughly acquaint himself with the specifications and requirements prior to submitting his bid for the work covered. The contractor shall be regularly engaged in this type of work. Any equipment, apparatus, machinery, material, small items not mentioned in detail and labor not hereinafter specifically mentioned which may be found necessary to complete or perfect any portion of the installation in a substantial manner and in compliance with the requirements stated, implied or intended in these specifications or accompanying Drawings shall be furnished and installed without extra cost to the Owner.

All material and workmanship shall be first class and in accordance with state and local codes and with the following specifications.

Gas/Oil Burners

Furnish and install on each of the existing two cast iron H.B. Smith Co., Model No. 440-S-12 water tube boilers, a natural gas/No. 4 fuel oil burner for firing the boiler to full rated capacity.

The oil firing components shall be of the low pressure air atomizing type. The oil metering device shall be of the variable delivery, positive displacement type and shall be independent of oil viscosity. The oil nozzle shall be a product of the burner manufacturer. The primary air for atomization shall be supplied by a compressor and oil/air tank, inlet air filter, lube oil sight glass and ¼ H.P. drive motor. Dual oil solenoid valves shall be furnished. The burner shall be for No's. 2, 4 and 5 fuel oils.

The air compressor module shall be burner mounted and shall be interlocked through an atomizing air pressure switch which will shut the burner down in the event of lost atomizing air.

The burner air housing shall be hinged and when opened shall permit ready access to the nozzle, scanner, pilot assembly and diffuser. The air impeller shall be of the backward curve design made of cast aluminum, dynamic and moment balanced and shall be self cleaning and be driven by a 1 H.P. motor.

A separate gas pilot shut-off and separate gas pressure regulator and two automatic pilot gas solenoid valves shall be provided for the burner for interrupted gas/electric ignition.

Each 2½" main gas piping system shall conform to U.L. specifications and shall include one Honeywell V4055/5055 motorized main safety shut-off valves, and one K-3 solenoid valve, manual shut-off valves, high and low pressure switches, Maxitrol RV-91 main gas pressure regulator, and pressure gauge. A butterfly input valve shall regulate the firing rate and shall be operated by the modulating motor. The N.O. vent valve shall be 1" pipe size and shall be piped to the building exterior

along with all vent piping as directed. Each gas train shall be installed where directed by the Engineer.

The burner requires 6.0 W.C. gas pressure at the gas train inlet at full flow.

The burner shall be equipped with low fire start and shall be capable of running on either full modulation and/or manual modulation. The turn down shall be a minimum of 5 to 1. The burner shall supply all of the combustion air. A minimum CO_2 of 12%, and not greater than a #1 Bacharach smoke spot shall be produced when firing heavy oil. A minimum of 9 CO_2 is required on gas firing.

Gas/oil selection shall be by a fuel selector switch with no part changes required.

The burners shall be Industrial Combustion Model No. MMG-30 rated at 22.5 G.P.H. No's 2 and 4 fuel oil and 3000 MBH natural gas input. Power requirements are 120/208 V. 3 phase.

Burner Control Panel

The Contractor shall remove all unused existing controls from the existing control panel board. Rewire the existing controls required to remain to operate the new burners.

The control panel system shall be burner mounted and shall include the following for each burner:

A. Branch fuse protection for each motor, oil heater and control circuit.
B. Fireye 5023 flame safeguard controller.
C. Blower motor starter.
D. Air-oil pump motor starter.
E. Gas/oil selector.
F. Indicating lights for:

    1. Power on
    2. Oil on
    3. Flame failure
    4. Gas on
    5. Ignition on
    6. Low water

G. Oil pump manual-auto selectors.
H. Oil pump motor relay.
I. Fuel selector switch with center off position.
J. Required wiring, trough wiring and terminal strip.
K. Two boiler lead-lag control system.

Boiler Controls

Furnish and install the following new controls on the boiler and wire the operating and limit controls and low water cut-offs, relays time clocks and emergency switches to the burner control circuits:

1. Limit control, Honeywell L404A.
2. High limit control with manual reset, Honeywell L404C.
3. Modulating control, Honeywell L404A.
4. Lead-lag controls on main steam header, L404A.
5. Aquastat, L4006A.

BOILERS

Suggested Rules for Care and Operation

PREPARING BOILERS FOR SERVICE

CONDITIONING. If the boiler is new or has been out of service for an appreciable period, or has been opened for cleaning or repairs take these precautions: Before closing the water sides examine both the fire side and water side to make certain that each is free from any foreign matter, equipment or tools. All loose material in the form of dirt, trash, scale, soot or other deposits should be removed by washing, mechanical or other means. Gaskets for handhole and manhole openings should be new or in good condition and should be pulled tight prior to placing water in the boiler. The combustion chamber and gas passages should be clean, tight and in good repair. All cleanout and access doors should fit properly in setting and be closed tightly.

HOT WATER SYSTEM. Check the altitude gauge which indicates the pressure of water in the system. The black and red hands on the gauge should be together when the pressure in the system is adequate to circulate water to the highest point in the system. Check the expension tank. If water-logged, drain and refill allowing for proper air cushion space. Hand test relief valve.

STEAM SYSTEM. Check water level. Test water column and water glass drain valves, gauge cocks and feed water supply valves to determine if they are in good working condition.

STARTING THE BOILER

Make certain that all valves in the lines supplying the heating system are completely open. All draft devices should be checked to make certain that the furnace is being properly ventilated. SOLID FUEL. Do not use highly inflammable oils or gasoline to ignite fuel. GAS OR OIL. If a torch is used make certain that it is placed near and just under the tip of the burner to be lighted. If fuel does not ignite immediately (within five seconds) after feed valve is opened, or if torch is snuffed out, remove the torch, shut-off fuel and ventilate the furnace (not less than five minutes). Always use a torch or other ignition device for lighting burners. Do not attempt to light a burner from an adjacent operating burner. After burners are in operation be certain that the flame does not impinge on the furnace brickwork or metal walls of the boiler. Start the fire well in advance of heating needs so that it will not be necessary to force the boiler. Avoid operating at low firing rates because incomplete combustion or loss of ignition may result in a furnace explosion.

CUTTING-IN BOILER

In placing a steam boiler in operation on the line with others which are already in service, keep its steam stop valve closed until the pressure within the boiler has become exactly equal to that in the steam main. Drain the steam piping thoroughly before the valve is opened. Open the valve slightly. If there is no unusual jar or disturbance in the main or boiler, continue to open the valve slowly. Close the valve at once if there is the slightest evidence of an unusual jar or disturbance about the boiler.

WATER LEVEL

When going on boiler room duty, always determine the level of the water in the boilers. The gauge glass, gauge cocks and connecting lines should be blown at regular intervals to make certain that all connections are clear and in proper operating order. The water level in the gauge glass of a steam boiler should not vary greatly. If there is any question as to the accuracy of the water level indicated and if the true level cannot be determined immediately, the boiler should be removed from service and all water level instruments checked. Call in your heating contractor if necessary. To test water level open drain quickly and drop water in gauge. Water level should return quickly after valve is closed. Record a weekly test of this kind on the Boiler Operating Log.

LOW WATER

If the water level is below the water glass and you are not certain about the feed water situation, stop the supply of air and fuel and close the dampers. SOLID FUEL. Cover the fuel bed with ashes, fine coal or earth. Close the ashpit doors and leave the fire doors open. GAS OR OIL. Shut off the fuel supply valves to the burners. DO NOT ADD WATER TO THE BOILER. Do not open the safety valve or tamper with it in any way. After the boiler is cool, determine the cause of low water and have it corrected. To test the Low Water Fuel Cut-Off and/or Feedwater Regulator, drain float chamber while boiler is operating. This should interrupt the circuit and stop the fuel supply. A weekly test should be entered in the Boiler Operating Log.

FEEDWATER PUMP & RETURN SYSTEM

The water returning from a heating system should be ample for the boiler if the system is tight. The need of additional water of more than one inch in the gauge glass of a steam system, or one foot according to the altitude gauge of a hot water system per month, is indicative that water is being lost from the system. The cause of this loss should be determined and necessary corrections made. Water, when added, should be added slowly and at a time when the load is lightest. At least once a week check pump for proper operation and leaks. Examine traps, stop valves, check valves, make-up float valves and condition of condensate return tank. Record in Boiler Operating Log.

SAFETY OR RELIEF VALVES

Each safety or relief valve should have a try lever that may be opened by hand. Blow the safety valve at least once a week either by pressure of steam or by raising the try lever carefully. If the valve appears to be stuck do not attempt to release it until pressure is reduced. Never strike the body of the valve forcibly to jar the try lever loose. If any valve continues to discharge, even slightly, it should be removed and overhauled or replaced. Always observe the pressure registered on the steam gauge when the valve is flowing. If any great variation is noticed have the valve and gauge tested and adjusted. Enter test record in the Boiler Operating Log at least once a week.

BURNERS AND FUEL SYSTEM

All flame-failure and fuel supply devices should be properly tested in accordance with the manufacturer's instructions. Always have a factory trained service mechanic check, adjust and repair gas and oil burners and their controls prior to the start of the operating period, and at least once annually. Make frequent daily checks on flame condition. Check for fuel leaks. Enter a weekly inspection in the Boiler Operating Log.

CLEANING THE BOILER

OPERATING. The furnace and fire passages should be brushed clean during the operating period in order to economize on fuel and improve efficiency. The frequency with which this cleaning should be performed is dependent upon the type of fuel being used and the firing conditions. If the flue between the boiler and the stack becomes red hot it is an indication that too much heat is being wasted probably because of an accumulation of soot and dirt on the fire surfaces. A preferable time to do this work is on weekends or a time when the load is lightest.

NON-OPERATING. The furnace combustion chamber and gas passages of all boilers should be cleaned immediately after the end of the heating season. Cast iron boilers should remain filled with water to the working level during the summer. However, if the idle period is likely to include freezing weather the system should be drained. A Steel boiler should be empty, dry and clean—internally and externally—with the manhole and hand-hole plates removed during the idle period. Follow manufacturer's instructions for laying-up of the boiler or consult your insurance company inspector.

PREPARATION FOR INSPECTION

EXTERNAL. An external inspection by an authorized inspector comprises an outside examination of the boiler, its appurtenances and connections while the boiler is in service. No particular preparation is necessary.

INTERNAL. Preparation for this examination requires the proper cooling and opening-up of the unit together with a thorough cleaning of the fire side of pressure parts of the setting. The water surfaces of drums and tubes shall preferably not be cleaned (unless otherwise agreed upon) until after the inspector has had a chance to observe the conditions of these surfaces.

REPAIRS

Mark any joints or fittings which have shown signs of leakage. Make a record of any repairs needed to the boiler, to the system or to attachments. Have proper repairs made as promptly as possible after the end of the heating season so that the heating plant will be ready for service when needed. Never make repairs while the boiler is in service.

Burner Power and Control Wiring

Furnish and install new main power supply wiring and 120 V. control power to each burner control panel from the existing disconnects on the existing wall panel board.

Furnish and install new control wiring between the burner control panels, oil pump motor, boiler controls. Rewire the relays, selectors and program clock that remain on the existing panel board.

Burner Mounting

The new burners shall be flange mounted to the boiler front plate. Furnish and install a new ¼" steel front plate over the existing steel plate.

The existing side and rear wall plastic refractory and insulation shall remain. Furnish and install a new 4" plastic refractory front wall backed by 1" rigid insulation.

Fill the existing secondary air inlet area with fireback and insulation. Furnish and install new 2½" layer of 3000° fireback over the full combustion chamber floor.

Adjust the boiler doors for complete closing to eliminate fresh air infiltration to the boiler combustion chamber.

Gas Piping

Furnish and install a welded gas piping supply system from the meter to each burner. The main overhead piping supply shall be 4" pipe size with 3" minimum drop piping to each burner. Provide an approved shut-off cock, full pipe size at each burner. Piping shall be suspended in approved type hangers.

The piping system shall supply 6" W.C. to each burner inlet with both burners at a maximum firing condition.

The gas piping system shall be approved by the local gas utility company. Vent all components to the atmosphere as directed by Public Service Electric and Gas Company.

Fuel Oil Supply Pump Sets

Furnish and install at each burner, a Tuthill Model No. T-OLD 60 G.P.H. fuel oil supply pump set with a ⅓ H.P. 120-1-60 motor and built-in psig relief valve.

Fuel Oil Piping

The existing fuel oil supply and return piping shall remain and be reused for each boiler. Furnish and install new Span liquid filled pressure and vacuum gauges, a new 1" back pressure valve and a new 1" oil strainer in the oil piping at each burner. Furnish and install a new 1" Firomatic valve at each burner in the oil supply piping.

Fuel oil piping shall be as shown on the drawings.

Guarantee and Service

The oil burning system shall be guaranteed for a period of one year from date of initial firing, and shall be serviced free of charge for the one year by approved service personnel.

The initial firing shall include efficiency tests and fuel metering and shall be by the burner manufacturer or his local representative.

A written efficiency report shall be provided to the owner's representative.

Insulation

The Contractor shall furnish and apply all insulation on all new water piping and fittings, as manufactured by OWENS-CORNING FIBERGLASS, JOHNS-MANVILLE, KNAUF or approved equal.

All insulation shall be applied over clean dry surfaces, butting all sections or surfaces firmly together and finishing as specified. Adhesives shall be as manufactured by FOSTER or INSUL-COUSTIC (I-C), or approved equal.

1. Single self-sealing laps and butt strips are not acceptable. Dual adhesive self sealing laps with adhesive strips on both the jacket and jacket lap are acceptable.
2. Insulation shall be continuous through pipe hanger.

Piping shall be tested before insulation is applied or joints shall be left uncovered until tests have been performed. Contractor shall be required to remove and replace all insulation not applied in strict accordance with manufacturer's specifications or not presenting a neat appearance.

All insulation shall have composite insulation (jacket or facing, and adhesive used to adhere jacket or facing to the insulation), fire and smoke hazard ratings, as tested by Procedure ASTM E-84, NFPA 255 and UL 73, not exceeding flame spread of 25, fuel contributed of 50 and smoke developed of 50. Accessories, such as adhesives, mastics, cements, paper and cloths for fittings shall have component ratings, as listed above.

Specified mastics, adhesives and coating shall be applied in strict accordance with manufacturer's instructions, including recommended coverages.

Piping

Insulate new installed water piping with fiberglass, one-piece insulation having a factory applied all service jacket.

Seal all jacket laps and butt joint strips on hot water piping with FOSTER 3-36 adhesive.

Seal all jacket laps and butt joint strips on cold water piping with FOSTER 82-07 adhesive.

Note: Where staples are used, they shall be heavily coated with same adhesive used for laps and joints.

Fittings

Fittings shall be insulated with insulating cement of equal thickness to adjacent pipe insulation.

Furnish fitting insulation with glass cloth imbedded between two coats of same adhesive used for the laps, overlapping the adjacent insulation a minimum of two inches.

Cleaning

After the insulation work is completed, all debris, scrap, cartons, droppings, etc., shall be thoroughly cleaned up by the Insulation Contractor. If the cleaning work is not satisfactory to the Engineers, the work will be done by others and will be back-charged to this Contractor.

Domestic Water Heater

Furnish and install a water heater Model No. BC-200, as manufactured by A.O. SMITH, or an approved equal. Heater shall be gas fired capable of supplying 180 GPH at 100°F temperature rise equipped to burn natural gas, and bearing the ASME code symbol.

Heater shall be reverse flow type having all non-ferrous waterways, and employing a copper finned heat exchanger and a tightly wound copper coil combustion chamber.

Heater shall be equipped with an electric gas valve of the step-opening type, a rod and tube automatic gas shut-off device which will break the electric circuit on temperature rise, a gas supply shutoff to the main burner in the event of an accidental extinguishment of the pilot gas flame, a gas pressure regulator properly set for the gas to be supplied, stainless steel main burners, and a coil limit switch for shutoff in event of excessive water temperature, thermal balancer, a certified draft diverter and a JOHNSON safety flow switch wired in series with the main gas valve.

Outer jacket shall be of baked enamel finish.

Limited Sprinkler System

Furnish and install a limited wet pipe automatic sprinkler system as shown and with components as manufactured by VIKING, GRINNELL, POTTER-ROEMER or approved equal.

All work shall be installed in conformance with NFPA #13 requirements and shall be approved and accepted by the State Fire Marshal's Office and the local Municipal Fire Department. The requirements and standards of these organizations shall take precedence over the specification in the event of conflict.

All work shall be done in accordance with the best practices known to the trade. Run piping in a neat and orderly manner, and support in a substantial manner

Sprinkler heads shall be bronze construction, soldered link and lever type, with required degree rating recommended for the particular location.

1. Heads shall be rough bronze upright type.

The Contractor shall furnish a boxes set of 6 spare heads with wrench and shall install same in a wall mounted red enamel cabinet with lock, where directed by the Owner.

Furnish and install a 1 inch (minimum) valved test connection, piped as shown. Valve shall be located a maximum of 7'-0" above finished floor.

Supervisory switch: POTTER-ROEMER Fig. 6220 red baked enamel cover with J. Bolt mounting for O.S.&Y. valves. Wiring by Contractor.

Flow switch: POTTER-ROEMER Series 6200 or 6210, red enamel tamper proof switch housing with flow paddle. Wiring by Contractor.

Piping Fittings & Joints: Sprinkler piping to be Black steel Sch. 40 with screwed malleable iron or cast iron fittings with pipe joint compound or teflon tape. Contractors option to use Copper Type "L" with 95-5 solder joints.

Chain Link Fence

Furnish and install a chain link fence enclosure for the exterior pad mounted gas meter.

Fencing shall be 9 gauge steel wire fabric, 2" mesh, both top and bottom selveges twisted and barbed, with ASTM A-392, Class I galvanized finish.

Posts shall be galvanized steel ASTM A-120, 2.375" O.D. for end posts and 2.875" O.D. for gate post, with weathertight cap for each post.

Gate shall be swing type constructed of 1.66" O.D. tubular members assembled with fittings or welded, with fabric same as fencing. Gate shall be complete with latch, stops, keeper and hinges.

Bands or clips of adequate strength shall be provided for attaching fabric to posts at intervals not to exceed 15 inches.

Posts shall be imbedded in concrete pad. Concrete mix shall be Portland Cement (ASTM C150), aggregate (ASTM C33), and clean water, proportional and mixed to obtain minimum 28 day compressive strength of 2500 psi. Provide WWF mesh in pad.

Electrical Work

Rules and Regulations

All electrical work shall be done by a licensed Electrical Contractor, in strict accordance with the National Electrical Code (NFPA #70) and all local codes and ordinances and power company regulations.

The Contractor shall furnish the Owner a copy of the final inspection and approval certificate from the Middle Department Association of Fire Underwriters covering all electrical work included in this contract.

Testing

The contractor shall make tests of the various systems as are conventional and as the Engineers may direct to demonstrate freedom from grounds, shorts, etc. The Contractor shall supply approved instruments for such test, if required.

Removals

The Contractor shall disconnect all equipment that is scheduled to be removed and he shall remove all existing conduit and wire for equipment being removed. Close up all unused openings in existing panelboard and wireway.

Outlet or Junction Boxes

Shall be as manufactured by NATIONAL, STEEL CITY, APPLETON, or RACO.

Grounding

Ground of the entire electrical system shall be done in full accordance with the latest NEC rules.

They shall be galvanized and of a type adopted as standard for the particular use with covers as required for the particular device or condition. Boxes shall be 4" trade size and shall be provided as required for unusual conditions. Outlet boxes shall be firmly secured to the walls, beams or ceiling construction, and in no case shall be dependent upon conduit for support.

Conduit

All wires and cable shall be installed in conduit. Minimum size of conduit shall be ½ inch. Conduits shall be E.M.T. thinwall, rigid galvanized steel or ICM, as required by Code.

All conduit shall be delivered at the building in not less than ten foot lengths, each length of conduit to have approval stamp of the Underwriters.

Joints shall be made tight with standard couplings, and corners turned with fittings, elbows or long radius bends. The ends of all conduit or elbows shall be cut square and reamed.

Flexible metallic conduit may be used where rigid conduit is impractical. All connections to motor or appliance terminal boxes shall be made with a minimum of 18 inches of flexible conduit to take up vibration and movement.

All ends of conduit 1¼" and larger, shall be provided with an insulated bushing O.Z., or equivalent.

All conduit installed exposed shall run at right angle to the building wall or walls of rooms in which they are installed, and shall be supported at intervals not exceeding 8'-0".

Conduit shall be NATIONAL, TRIANGLE, WALKER, or approved equal.

Wire and Cable

Shall be made by NATIONAL, GENERAL CABLE, HABERSHAW, TRIANGLE, U.S. RUBBER, or approved equal. All wire shall be run in conduit. Wire shall be Type THWN, unless otherwise noted on the plans or specified herein. Wire #10 gauge and smaller shall be solid single braid. Wire #8 and larger shall be stranded, double braid. Wire sizes shall be as shown on the plans or mentioned elsewhere in these specifications. All wire shall have 600 volt insulation. Where not specifically mentioned, #12 gauge shall be used. On branch circuit runs over 100 ft. long, use #10 gauge wire. Boiler burner tailpiece heating wiring shall be Type AVA.

Boiler Wiring

The new burners are the prewired package type. A certain amount of field wiring will be required between burner control panel and associated boiler controls. All wiring shall be in accordance with wiring diagrams furnished by the burner manufacturer.

Grounding

The entire electrical system shall be grounded in full accordance with the latest NEC rules.

Fire Alarm Panel

The new fire alarm panel is manufactured by Standard Electric Time, whose catalog numbers appear hereafter. Standard Electric Time/Faraday equipment or approved equal shall be accepted. Equipment shall be approved and listed by the Underwriters' Laboratories and bear their label.

1. Single zone DC control panel CAT. No. 15101.
2. Lead acid battery and enclosure CAT. No. 14040.

The new single zone control panel shall be tied into the existing control panel to sound an alarm during sprinkler operation.

The system extension, including all conduit wiring and outlet boxes, shall be completely furnished and installed by the Contractor and all wires shall be properly tagged. Final connections shall be supervised by a factory trained technician from the manufacturer of the system. The installation shall comply with the applicable requirements of the National Electrical Safety Code. The wiring shall be in accordance with that shown and required by the equipment manufacturer's wiring diagrams. All wiring shall be in conduit.

Contractor shall guarantee all equipment and wiring free from inherent mechanical and electrical defects for a period of one year from the date of installation.

Alternates

Alternate No. 1

State the amount to be added to the Base Bid if the existing hot water storage tank and bare piping connections to same are insulated.

The piping insulation shall be as noted under INSULATION in the specifications.

The hot water storage tank shall be insulated with 1½" thick calcium silicate cut and mitered to fit the tank shape and contours. Secure insulation in place with 16 ga. galvanized wire or ½" galvanized strapping. Point up all joints with insulating cement.

1. Cover insulation with 1" galvanized hexagonal wire mesh secured to wire or strapping. Lace edges of wire mesh. Apply two coats of insulating cement with glass fabric imbedded between coats. Trowel final coat to a smooth finish.

Specifications for Blacktopping of Driveway
Morgan Park Junior High School
Bid #103

Independent School District No. 709

1. *INFORMATION FOR BIDDERS:* Sealed bids upon items herein described will be received at Independent School District No. 709, Lake Avenue and Second Street, Duluth, Minnesota 55802, up to and until 10:00 a.m., local time, Tuesday, September 2, 1986. All bids must be on forms similar to that attached hereto and must be addressed to Mr. M. J. Viele, Director of Purchases for Independent School District No. 709, at the address aforesaid, with the envelope conspicuously marked: "BID ON BLACKTOPPING."

2. *EXAMINATION OF SPECIFICATIONS:* Bidders must familiarize themselves with these specifications and comply strictly with same.

3. *PATENTS AND GUARANTEES:* The contractor shall secure to Independent School District No. 709 the free and undisputed right for all time to the use of any and all such equipment or parts thereof as may be patented, shall defend at its expense any and all suits for infringement and pay all awards if any claims be determined adversely, and shall in all respects save the School District harmless on account of any of the matters aforesaid or any expense occasioned the School District by reason thereof. Each bidder shall attach to his proposal all guarantees,

if any, which are provided by the manufacturer of any or all said equipment and/or materials.

4. *CERTIFIED CHECK OR BIDDER'S BOND:* Each bid or proposal must be accompanied by a bidder's bond or certified check made payable to the order of Independent School District No. 709 in an amount of five percent (5%) of the total amount bid. If any bid is accepted and the bidder neglects or refuses to promptly enter into a contract therefore, and to furnish the surety bond for the performance of the bid aforesaid, then the said certified check or bidder's bond and the amount thereof shall be forfeited to the School District as liquidated damages and the School District will cash said check or bidder's bond and apply the proceeds toward the payment of such damages.

5. *CONTRACT AND BOND:* The successful bidder, shall if required, promptly enter into a contract with the School District for the performance of said bid and the delivery of said equipment to the satisfaction of the School Board; and the successful bidder shall also furnish a surety bond in that amount of said contract for the satisfactory performance of the same, said surety and the terms and conditions of said bond to be subject to statute and the approval of the School Board. No bidder may withdraw his bid for at least forty-five (45) days from the scheduled closing time for receipt of bids.

6. *FORM OF PROPOSAL:* As part of these specifications, there is submitted a Form of Proposal which each bidder must adopt and use. No bid will be considered unless submitted upon said Form of Proposal.

7. *THE RIGHT TO ACCEPT OR REJECT BIDS:* The School Board reserves the right to accept or reject any and all bids, and the further right to accept or reject any bid item, and to waive informalities. The School District may also ascertain the qualifications of any bidder by requesting information as to the equipment, staffing, insurance and previous experience in work of this type. The bidder, if requested, will submit a list of not less than four installations of similar type that have been done during the past five years within a radius of 200 miles.

8. *CHANGES:* The School Board of the School District reserves the right without notice to the surety in the bond required by the contractor, to make minor changes in the materials called for by said specifications, the reasonable cost of such changes, if any, to be adjusted between the School Board and the Contractor, but no changes shall be made by the contractor except upon written order of the Director of Physical Plant.

No assignments, modification, or change in the contract or change in the equipment to be provided thereunder, or any extension of time for the completion of the contract shall release the surety of the bond.

If it appears that the contractor has supplied equipment which is inferior in workmanship or materials, or which does not otherwise conform to the specifications, either as originally drawn or as modified, the School Board, regardless of any acceptance or payment, may cause materials to be provided in conformity with said specifications, all at the cost and expense of the contractor and the surety of his bond.

9. *GENERAL CONDITIONS:* The contractor shall furnish all labor, material, tools and equipment to do the work specified in a satisfactory manner. He shall carry workmen's compensation, public liability, and property damage insurance to fully protect the School District against any damages in the performance of the work. (copy of Insurance Requirements attached) and shall submit evidence of insurance coverage before commencing work.

10. *NONDISCRIMINATION POLICY:* The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, sex or national origin.

11. *VISITING SITE:* Bidders should visit the site of proposed work with the conditions that will be encountered in carrying out the work. Failure to do this will not relieve the contractor from finishing the work without additional cost to the owner. A "Pre-Bid Conference" has been set for Tuesday, August 26th at 11:00 a.m. local time. The conference is to take place at Morgan Park School. All bidders shall attend the date and hour of the conference. This conference will be for the purpose of reviewing foreseeable problems, procedures, and methods relating to the blacktop work, including but not limited to:

Review of all project requirements (drawings, specification)
Review required submittals, if any
Review status of existing conditions
Review procedures for coping with unfavorable weather conditions
Site visitations.

The areas stated in t ecifications are for information only and are not guaranteed by the owner. areas may be deleted and others added via addenda.

12. *CONCURRENT OPERATIONS:* Because other activities of the owner will be proceeding at the same time as the work covered by this specification, the contractor shall notify Dale Anderson, Supervisor of Maintenance and Construction, before equipment and materials are moved onto the site and call prior to commencing work to ensure that all contract work progresses in a manner which does not conflict with other school activities.

13. *INSPECTION OF WORK IN PROGRESS AND UPON COMPLETION:* The School Board reserves the right to assign an owner's representative to be on the site any and all the time the contractor is on the job. As directed by the owner's representative, the contractor shall cut core sample from newly laid asphalt for testing by Lake Head Testing Co., Duluth, Minnesota in order to establish the amount of material used per square yard and shall restore such areas to sound condition.

In the event that such core cuts disclose any deficiencies in material, or soundness in construction, the contractor shall, at his own expense, apply additional materials or otherwise correct the deficiencies to the satisfaction of the owner's representative.

Noncompliance with the terms of this specification and ensuing contract can result in either the cancellation of the contract, or complete replacement of the defective areas at the contractor's expense. In the event of cancellation, the owner will not be obligated to compensate the contractor for any work undertaken in a defective manner.

14. *LICENSE REQUIREMENTS:* The successful bidder must be properly licensed according to the governing ordinance of the City of Duluth. Permit Number must be shown on Bid Form. Contractor shall also be responsible for obtaining all necessary permits and shall comply with all state and city building codes.

The contractor shall be recognized blacktop contractor, skilled and experienced in the type of blacktopping specified and equipped to perform workmanship in accordance with recognized and specified standards. The contractor shall have

not less than five (5) years experience with blacktop projects of magnitude equivalent to the specified work.

15. *JOB CONDITIONS:* All surfaces to be treated shall be smooth, visually dry, and free from debris and foreign matter before any treatment is initiated. The contractor shall be responsible for exercising all reasonable precautions to avoid fires being started, and shall provide suitable fire extinguishers, which are to be located so that they can be promptly used when required. Competent operators shall be in attendance at all times when equipment is in use. Materials shall be stored neatly in areas designated by owner's representative, and dispersed so as to insure a minimum fire hazard.

All work shall be begun as soon as possible and shall be completed without delays. All work shall be completed with good quality workmanship acceptable in the trade. The areas shall be left in a clean condition, free of debris and obstructions. The contractor, in accepting the contract for this work, assumes the responsibility of damage to existing facility due to negligence on his part.

16. *ITEMS TO BE BID UPON:* MORGAN PARK JUNIOR HIGH SCHOOL Blacktop driveway and parking lot (Print Attached).

A. All driveways and parking lots to be 4" of compacted asphalt—2½" of base course and 1½" of wearing course.
B. Base preparation to be done by owner.
C. Blacktop to be sloped away from building.
D. Compaction of mixtures shall be obtained by the "Ordinary Compaction" method described in MN/DOT 2331.3H.

MATERIALS

A. Base Course—Bituminous. The percent of asphalt in the bituminous mixture shall be in the range of 4.5%–5.0% using Asphalt Cement 85–100 in accordance with MN/DOT Specification 2341.
B. Wear Course—The percent of asphalt in the bituminous mixture shall be in the range of 5.5% to 6.0% using Asphalt Cement 85–100 in accordance with MN/DOT Specification 2341.
C. Bituminous Tact Coat—Shall be constructed and placed between bituminous courses. The bituminous material for tact coat shall be RC250 as per MN/DOT Specification with Bituminous material being applied at a uniform rate not to exceed 0.025 gallons per square of surface.
D. The Tact Coat and all costs incurred by the contractor placing the tact coat will be considered incidental expense for which no direct compensation will be made.

INSURANCE REQUIREMENTS

CONTRACTS TO $100,000

The contractor shall obtain the following insurance in companies satisfactory to the Owner and for limits not less than those listed, and shall maintain insurance coverage in force for the duration of the contract.

FORM OF INSURANCE	LIMITS OF LIABILITY
1. Worker's Compensation	Statutory
Employer's Liability	$500,000
2. Comprehensive General Liability	
A. Bodily Injury	$500,000 per occurrence $500,000 aggregate
B. Property Damage	$500,000 per occurrence $500,000 aggregate
Coverage shall include:	
Premises and operations liability	
Product liability	
Completed operations liability	
Independent contractors liability	
Contractual liability	
Personal injury liability	
3. Automobile Liability Insurance	
A. Bodily Injury	$250,000 per person $500,000 per occurrence
B. Property Damage	$250,000 per occurrence

A "Certificate of Insurance" shall be filed with the Director of Physical Plant. The certificate shall include a provision that the Independent School District No. 709 shall receive no less than thirty days notice of cancellation, non-renewal, or any material changes in the policy.

FORM OF PROPOSAL

DATE _____

School Board of Independent School District No. 709

BID NO. 103

The undersigned, having carefully examined the specifications on file in the office of the Director of Physical Plant of the School District and being familiar with the location of said work hereby proposes to furnish labor, equipment and material to blacktop driveway, parking lot and playgrounds at Morgan Park Junior High School, in strict accordance with said specifications.

COMPLETE COST OF INSTALLATION OF ASPHALT BLACK TOPPING—MORGAN PARK JUNIOR HIGH SCHOOL.

COMPLETE COST $ _____

The School Board reserves the right to accept or reject any or all bids and to waive informalities. If the above bid is accepted, the undersigned will promptly enter into a contract with the School District for the performance of his said bid and will promptly furnish a surety bond, all as required by the specifications.

The certified check or bidder's bond in the amount of five percent (5%) of the total bid in the amount of $ _____ payable to Independent School District No. 709, St. Louis County, Minnesota is herewith enclosed, said check and the amount thereof to be forfeited to the School District as liquidated damages if the offer of the undersigned bidder is accepted and said bidder thereupon neglects or refuses to promptly enter into such contract and to provide such bond as may be required.

Bids submitted shall be valid for forty-five (45) days from the date of bid opening.

City Permit No. _____

Addendum # _____ received
Addendum # _____ received
Addendum # _____ received

_____
Name of Bidder

By _____
Authorized Representative

Address: _____

_____

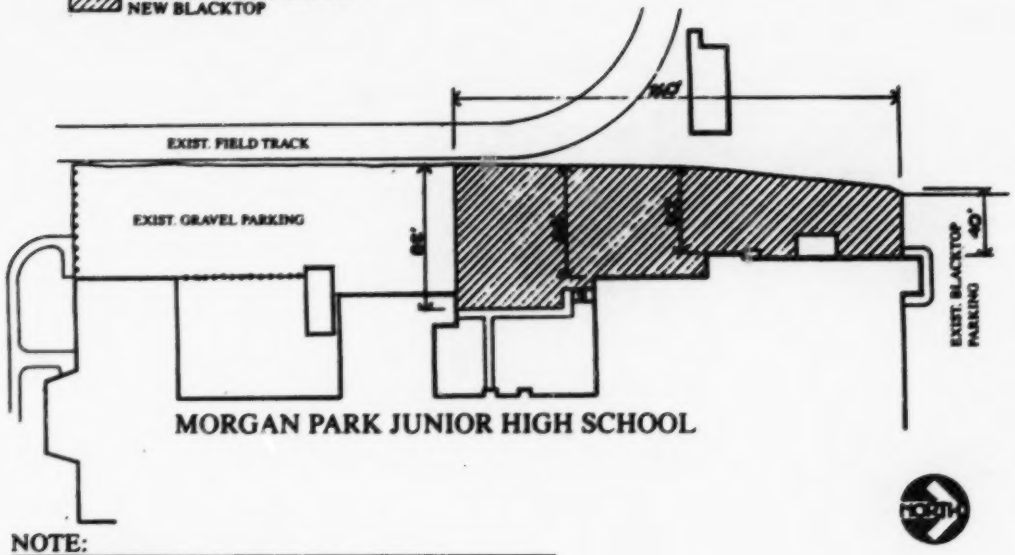
Telephone No. _____

ABOVE CORPORATION ORGANIZED UNDER LAWS OF: MINNESOTA

103

LEGEND

INDICATES AREA TO HAVE NEW BLACKTOP



NOTE:

DIMENSIONS ARE APPROX.
BASE PREPARATION TO BE DONE BY OWNER.
BLACKTOPPING TO BE 2½" BASE & 1½" WEAR COURSE.
TOTAL BLACKTOP APPROX. 16,000 SQ. FT.

PARKING LOT BLACKTOPPING—MORGAN PARK

SCALE: 1" = 60'

2/16/86

END

U.S. Dept. of Education

Office of Education
Research and
Improvement (OERI)

ERIC

Date Filmed

March 29, 1991